

**On various development of the “Hardy-Ramanujan Partition Formula”.
Applications to the Black Hole entropy and new possible mathematical
connections with some sectors of String Theory**

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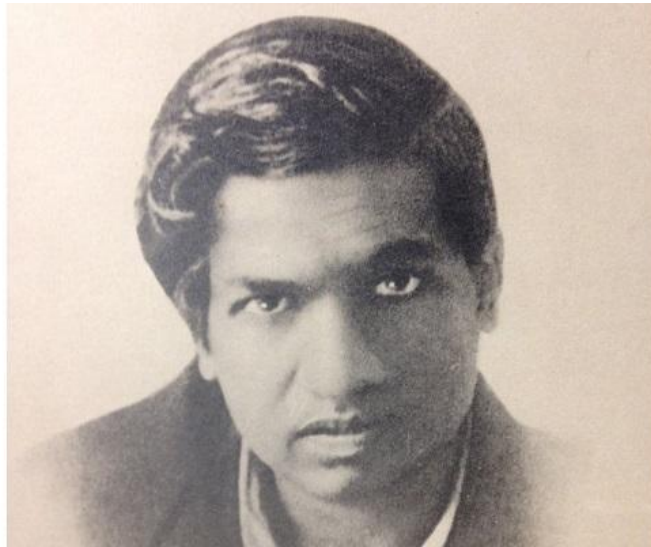
Abstract

In this research thesis, we describe various development of the “Hardy-Ramanujan Partition Formula”, the applications to the Black Hole entropy and the new possible mathematical connections with some sectors of String Theory

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Srinivasa Ramanujan (1887-1920)



<https://www.moduscc.it/ramanujan-il-grande-matematico-indiano-13453-131115/>

Vesuvius landscape with gorse – Naples



<https://www.pinterest.it/pin/95068242114589901/>

From:

A. A. Karatsuba, “On the zeros of arithmetic Dirichlet series without Euler product,” *Izv. Ross. Akad. Nauk, Ser. Mat.* 57 (5), 3–14 (1993)

On the Zeros of the Davenport Heilbronn Function

S. A. Gritsenko - Received May 15, 2016 - ISSN 0081-5438, Proceedings of the Steklov Institute of Mathematics, 2017, Vol. 296, pp. 65–87.

We have:

Let

$$\varkappa = \frac{\sqrt{10 - 2\sqrt{5}} - 2}{\sqrt{5} - 1}$$

and χ_1 be a character modulo 5 such that $\chi_1(2) = i$.

The Davenport–Heilbronn function $f(s)$ is defined by the equality

$$f(s) = \frac{1 - i\varkappa}{2} L(s, \chi_1) + \frac{1 + i\varkappa}{2} L(s, \bar{\chi}_1), \quad \text{where} \quad L(s, \chi) = \sum_{n=1}^{\infty} \frac{\chi(n)}{n^s}.$$

The function $f(s)$ satisfies the Riemann-type functional equation

$$g(s) = g(1 - s), \quad \text{where} \quad g(s) = \left(\frac{\pi}{5}\right)^{-s/2} \Gamma\left(\frac{s+1}{2}\right) f(s),$$

but there is no Euler product for it.

$$(\sqrt{10 - 2\sqrt{5}} - 2)/(\sqrt{5} - 1) = \kappa$$

Input:

$$\frac{\sqrt{10 - 2\sqrt{5}} - 2}{\sqrt{5} - 1}$$

Decimal approximation:

0.2840790438404122960282918323931261690910880884457375827591626661

...

$$0.28407904384\dots = \kappa$$

Alternate forms:

$$\frac{1}{4} \left(\sqrt{10 - 2\sqrt{5}} - 2\sqrt{5} + \sqrt{5(10 - 2\sqrt{5})} - 2 \right)$$

$$\frac{1}{4} (1 + \sqrt{5}) \left(\sqrt{10 - 2\sqrt{5}} - 2 \right)$$

$$\frac{1}{2} \left(-1 - \sqrt{5} + \sqrt{2(5 + \sqrt{5})} \right)$$

Minimal polynomial:

$$x^4 + 2x^3 - 6x^2 - 2x + 1$$

Expanded forms:

$$\frac{\sqrt{10 - 2\sqrt{5}}}{\sqrt{5} - 1} - \frac{2}{\sqrt{5} - 1}$$

$$\frac{1}{4} \sqrt{10 - 2\sqrt{5}} + \frac{1}{4} \sqrt{5(10 - 2\sqrt{5})} + \frac{1}{2} (-1 - \sqrt{5})$$

$$\text{For } (((\sqrt{(10-2\sqrt{5})} - 2))/(\sqrt{5}-1))) = 8\pi G; \quad G = 0.011303146014$$

Indeed:

$$((((\sqrt{(10-2\sqrt{5})}-2))/(\sqrt{5}-1))))/(8\pi)$$

Input:

$$\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{8\pi}$$

Result:

$$\frac{\sqrt{10-2\sqrt{5}}-2}{8(\sqrt{5}-1)\pi}$$

Decimal approximation:

0.0113031460140052147973750129442035744685760313920017808594909667
...

0.01130314.... = g (gravitational coupling constant)

Property:

$$\frac{-2+\sqrt{10-2\sqrt{5}}}{8(-1+\sqrt{5})\pi} \text{ is a transcendental number}$$

Alternate forms:

$$\frac{\sqrt{10-2\sqrt{5}}-2\sqrt{5}+\sqrt{5(10-2\sqrt{5})}-2}{32\pi}$$

$$-\frac{1 + \sqrt{5} - \sqrt{2(5 + \sqrt{5})}}{16\pi}$$

$$\frac{-1 - \sqrt{5} + \sqrt{2(5 + \sqrt{5})}}{16\pi}$$

Expanded forms:

$$-\frac{1}{16\pi} - \frac{\sqrt{5}}{16\pi} + \frac{\sqrt{10 - 2\sqrt{5}}}{32\pi} + \frac{\sqrt{5(10 - 2\sqrt{5})}}{32\pi}$$

$$\frac{\sqrt{10 - 2\sqrt{5}}}{8(\sqrt{5} - 1)\pi} - \frac{1}{4(\sqrt{5} - 1)\pi}$$

Series representations:

$$\frac{\sqrt{10 - 2\sqrt{5}} - 2}{(8\pi)(\sqrt{5} - 1)} = \frac{-2 + \sqrt{9 - 2\sqrt{5}} \sum_{k=0}^{\infty} \binom{\frac{1}{2}}{k} (9 - 2\sqrt{5})^{-k}}{8\pi \left(-1 + \sqrt{4} \sum_{k=0}^{\infty} 4^{-k} \binom{\frac{1}{2}}{k} \right)}$$

$$\frac{\sqrt{10 - 2\sqrt{5}} - 2}{(8\pi)(\sqrt{5} - 1)} = \frac{-2 + \sqrt{9 - 2\sqrt{5}} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (9 - 2\sqrt{5})^{-k}}{k!}}{8\pi \left(-1 + \sqrt{4} \sum_{k=0}^{\infty} \frac{\left(-\frac{1}{4}\right)_k \left(-\frac{1}{2}\right)_k}{k!} \right)}$$

$$\frac{\sqrt{10-2\sqrt{5}}-2}{(8\pi)(\sqrt{5}-1)} = \frac{-2+\sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (10-2\sqrt{5}-z_0)^k z_0^{-k}}{k!}}{8\pi \left(-1+\sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (5-z_0)^k z_0^{-k}}{k!}\right)}$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

We note that:

$$(((\sqrt{10-2\sqrt{5}}-2))/(\sqrt{5}-1))*((2i(\sqrt{5}-1)t + \sqrt{5}-1)/(2(\sqrt{2(5-\sqrt{5})}-2))) - 2)))$$

Input:

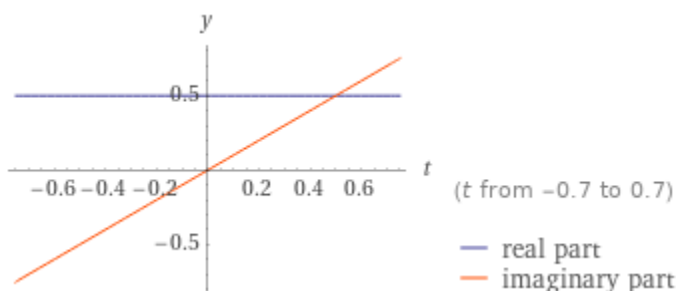
$$\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1} \times \frac{2i(\sqrt{5}-1)t + \sqrt{5}-1}{2\left(\sqrt{2(5-\sqrt{5})}-2\right)}$$

i is the imaginary unit

Exact result:

$$\frac{\left(\sqrt{10-2\sqrt{5}}-2\right)\left(2i(\sqrt{5}-1)t + \sqrt{5}-1\right)}{2(\sqrt{5}-1)\left(\sqrt{2(5-\sqrt{5})}-2\right)}$$

Plot:



Alternate form assuming $t > 0$:

$$\begin{aligned} & \frac{i \sqrt{10 - 2\sqrt{5}} t}{\sqrt{2(5 - \sqrt{5})} - 2} - \frac{2 i t}{\sqrt{2(5 - \sqrt{5})} - 2} + \\ & \frac{\sqrt{5(10 - 2\sqrt{5})}}{2(\sqrt{5} - 1) \left(\sqrt{2(5 - \sqrt{5})} - 2 \right)} - \frac{\sqrt{10 - 2\sqrt{5}}}{2(\sqrt{5} - 1) \left(\sqrt{2(5 - \sqrt{5})} - 2 \right)} - \\ & \frac{\sqrt{5}}{(\sqrt{5} - 1) \left(\sqrt{2(5 - \sqrt{5})} - 2 \right)} + \frac{1}{(\sqrt{5} - 1) \left(\sqrt{2(5 - \sqrt{5})} - 2 \right)} \end{aligned}$$

Alternate forms:

$$\frac{1}{8} (1 + \sqrt{5}) \left(2 i \sqrt{2(3 - \sqrt{5})} t + \sqrt{5} - 1 \right)$$

$$\frac{1}{2} (1 + 2 i t)$$

$$\frac{1}{2} + i t$$

$1/2 + it$ = real part of every nontrivial zero of the Riemann zeta function

Derivative:

$$\frac{d}{dt} \left(\frac{\left(\sqrt{10 - 2\sqrt{5}} - 2 \right) (2 i (\sqrt{5} - 1) t + \sqrt{5} - 1)}{(\sqrt{5} - 1) \left(2 \left(\sqrt{2(5 - \sqrt{5})} - 2 \right) \right)} \right) = i$$

Indefinite integral:

$$\int \frac{(\sqrt{10-2\sqrt{5}}-2)(2i(\sqrt{5}-1)t+\sqrt{5}-1)}{(\sqrt{5}-1)\left(2\left(\sqrt{2(5-\sqrt{5})}-2\right)\right)} dt = \frac{t}{2} + \frac{it^2}{2} + \text{constant}$$

And again:

$$(((\sqrt{10-2\sqrt{5}}-2))/(2x))) * ((2i(\sqrt{5}-1)t+\sqrt{5}-1)/(2(\sqrt{2(5-\sqrt{5})}-2))) = (1/2+it)$$

Input:

$$\frac{\sqrt{10-2\sqrt{5}}-2}{2x} \times \frac{2i(\sqrt{5}-1)t+\sqrt{5}-1}{2\left(\sqrt{2(5-\sqrt{5})}-2\right)} = \frac{1}{2} + it$$

i is the imaginary unit

Exact result:

$$\frac{(\sqrt{10-2\sqrt{5}}-2)(2i(\sqrt{5}-1)t+\sqrt{5}-1)}{4\left(\sqrt{2(5-\sqrt{5})}-2\right)x} = \frac{1}{2} + it$$

Alternate form assuming t and x are real:

$$\frac{\sqrt{5}-1}{x} = 2$$

Alternate form:

$$\frac{(\sqrt{5} - 1)(1 + 2it)}{4x} = \frac{1}{2} + it$$

Alternate form assuming t and x are positive:

$$2x + 1 = \sqrt{5}$$

Expanded forms:

$$\begin{aligned} & \frac{i\sqrt{5(10-2\sqrt{5})}t}{2\left(\sqrt{2(5-\sqrt{5})}-2\right)x} - \frac{i\sqrt{10-2\sqrt{5}}t}{2\left(\sqrt{2(5-\sqrt{5})}-2\right)x} - \frac{i\sqrt{5}t}{\left(\sqrt{2(5-\sqrt{5})}-2\right)x} + \\ & \frac{it}{\left(\sqrt{2(5-\sqrt{5})}-2\right)x} + \frac{\sqrt{5(10-2\sqrt{5})}}{4\left(\sqrt{2(5-\sqrt{5})}-2\right)x} - \frac{\sqrt{10-2\sqrt{5}}}{4\left(\sqrt{2(5-\sqrt{5})}-2\right)x} - \\ & \frac{\sqrt{5}}{2\left(\sqrt{2(5-\sqrt{5})}-2\right)x} + \frac{1}{2\left(\sqrt{2(5-\sqrt{5})}-2\right)x} = \frac{1}{2} + it \end{aligned}$$

$$\frac{i\sqrt{5}t}{2x} - \frac{it}{2x} + \frac{\sqrt{5}}{4x} - \frac{1}{4x} = \frac{1}{2} + it$$

Solutions:

$$t = \frac{i}{2}, \quad x \neq 0$$

$$x = \frac{\sqrt{5}}{2} - \frac{1}{2}$$

Input:

$$\frac{\sqrt{5}}{2} - \frac{1}{2}$$

Decimal approximation:

0.6180339887498948482045868343656381177203091798057628621354486227
...

$$0.6180339887\dots = \frac{1}{\phi}$$

Solution for the variable x:

$$x = \frac{-2i\sqrt{5}t + 2it - \sqrt{5} + 1}{-2 - 4it}$$

Implicit derivatives:

$$\frac{\partial x(t)}{\partial t} = \frac{2(-1 + \sqrt{5} - 2x)x}{(-1 + \sqrt{5})(-i + 2t)}$$

$$\frac{\partial t(x)}{\partial x} = \frac{(-1 + \sqrt{5})(-i + 2t)}{2(-1 + \sqrt{5} - 2x)x}$$

From:

Asymptotic formulæ in combinatory analysis – Srinivasa Ramanujan and G. H. Hardy - Proceedings of the London Mathematical Society, 2, XVII, 1918, 75 — 115

A mathematics work is like a painting. Let's just imagine it's with colors we can't see. Maybe there is someone else who can see the painting and understand it too. And it will be important to them. There are patterns in everything. In mathematics these patterns reveal themselves in the most incredible forms. For me, mathematics is everything. I do all this because I have to: I see it. An equation means nothing to me if it does not express a thought of God. (Srinivasa Ramanujan)

We have:

$$(1.53) \quad C = 2\pi/\sqrt{6} = \pi\sqrt{\frac{2}{3}}, \quad \lambda_n = \sqrt{(n - \frac{1}{24})}.$$

where D is any number greater than

$$\frac{1}{2}C = \frac{1}{2}\pi\sqrt{\left(\frac{2}{3}\right)}.$$

The next step is naturally to direct our attention to the singular point of $f(x)$ next in importance after that at $x = 1$, viz., that at $x = -1$; and to subtract from $f(x)$ a second auxiliary function, related to this point as $F(x)$ is to $x = 1$. No new difficulty of principle is involved, and we find that

$$(1.61) \quad p(n) = \frac{1}{2\pi\sqrt{2}} \frac{d}{dn} \left(\frac{e^{C\lambda_n}}{\lambda_n} \right) + \frac{(-1)^n}{2\pi} \frac{d}{dn} \left(\frac{e^{\frac{1}{2}C\lambda_n}}{\lambda_n} \right) + O(e^{D\sqrt{n}}),$$

where D is now any number greater than $\frac{1}{3}C$. It now becomes obvious why our earlier approximation gave errors alternately of excess and of defect.

From:

$$p(n) = \frac{1}{2\pi\sqrt{2}} \frac{d}{dn} \left(\frac{e^{C\lambda_n}}{\lambda_n} \right) + \frac{(-1)^n}{2\pi} \frac{d}{dn} \left(\frac{e^{\frac{1}{2}C\lambda_n}}{\lambda_n} \right) + O(e^{D\sqrt{n}}),$$

where D is any number greater than

$$\frac{1}{2}C = \frac{1}{2}\pi\sqrt{\left(\frac{2}{3}\right)}.$$

$$1/e(\text{Pi}*\text{sqrt}(2/3))$$

Input

$$\frac{1}{e} \left(\pi \sqrt{\frac{2}{3}} \right)$$

Result

$$\frac{\pi \sqrt{6}}{3 e}$$

Decimal approximation

0.9436474295889496468632107667680295165896340625854406425454040771

...

0.94364742....

For $d/dn = 1$, we have:

$$\frac{1}{(2\text{Pisqrt}2)} \exp((((\text{Pisqrt}(2/3))\text{sqrt}(200-1/24))))/(\text{sqrt}(200-1/24))+((-1)^{200})/(2\text{Pi})\exp((((1/2*\text{Pisqrt}(2/3))\text{sqrt}(200-1/24))))/(\text{sqrt}(200-1/24)))+(e^{(0.94364742\text{sqrt}(200))})$$

Input interpretation

$$\frac{1}{2\pi\sqrt{2}} \times \frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{\sqrt{200-\frac{1}{24}}} +$$

$$\frac{(-1)^{200}}{2\pi} \times \frac{\exp\left(\left(\frac{1}{2}\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{\sqrt{200-\frac{1}{24}}} + e^{0.94364742\sqrt{200}}$$

Result

$$4.50459055654117... \times 10^{13}$$

$$4.50459055654117... * 10^{13}$$

Alternative representations

$$\frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{\sqrt{200-\frac{1}{24}}(2\pi\sqrt{2})} + \frac{\exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)(-1)^{200}}{\sqrt{200-\frac{1}{24}}(2\pi)} +$$

$$e^{0.943647\sqrt{200}} = \frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{\sqrt{200-\frac{1}{24}}(2\pi\sqrt{2})} +$$

$$\frac{\exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)(-1)^{200}}{\sqrt{200-\frac{1}{24}}(2\pi)} + w^a \text{ for } a = \frac{13.3452}{\log(w)}$$

$$\begin{aligned}
& \frac{\exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\sqrt{200 - \frac{1}{24}} (2\pi \sqrt{2})} + \frac{\exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right) (-1)^{200}}{\sqrt{200 - \frac{1}{24}} (2\pi)} + \\
& e^{0.943647 \sqrt{200}} = \frac{\exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\sqrt{200 - \frac{1}{24}} (2\pi \sqrt{2})} + \\
& \frac{\exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right) (-1)^{200}}{\sqrt{200 - \frac{1}{24}} (2\pi)} + z^{0.943647 \sqrt{200}} \text{ for } z = e
\end{aligned}$$

$$\begin{aligned}
& \frac{\exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\sqrt{200 - \frac{1}{24}} (2\pi \sqrt{2})} + \frac{\exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right) (-1)^{200}}{\sqrt{200 - \frac{1}{24}} (2\pi)} + \\
& e^{0.943647 \sqrt{200}} = 1 + \frac{2}{-1 + \coth(0.471824 \sqrt{200})} + \\
& \frac{\exp\left(\frac{1}{2} \pi \sqrt{\frac{2}{3}} \sqrt{200 - \frac{1}{24}}\right) (-1)^{200}}{(2\pi) \sqrt{200 - \frac{1}{24}}} + \frac{\exp\left(\pi \sqrt{\frac{2}{3}} \sqrt{200 - \frac{1}{24}}\right)}{(2\pi \sqrt{2}) \sqrt{200 - \frac{1}{24}}}
\end{aligned}$$

$p(200)$, for $d/dn = 0.08819889355$:

$$\begin{aligned}
& (1/(2\text{Pisqrt}2)*0.08819889355*(\exp((\text{Pisqrt}(2/3))\text{sqrt}(200-1/24))/(\text{sqrt}(200-1/24)))+((-1)^{200})/(2\text{Pi})*0.08819889355*\exp((((1/2(\text{Pisqrt}(2/3)))\text{sqrt}(200-1/24)))))/(\text{sqrt}(200-1/24)))+(e^{(0.943\text{sqrt}(200))}))
\end{aligned}$$

Input interpretation

$$\frac{1}{2\pi\sqrt{2}} \times 0.0881989 \times \frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{\sqrt{200-\frac{1}{24}}} +$$

$$\frac{(-1)^{200}}{2\pi} \times 0.0881989 \times \frac{\exp\left(\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\right)\sqrt{200-\frac{1}{24}}\right)}{\sqrt{200-\frac{1}{24}}} + e^{0.943\sqrt{200}}$$

Result

3.97299988437366005674592244864253726149707623460391719790726... $\times 10^{12}$

$3.97299988437... \times 10^{12} \approx p(200)$

Alternative representations

$$\frac{0.0881989 \exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{\sqrt{200-\frac{1}{24}} (2\pi\sqrt{2})} +$$

$$\frac{\left(0.0881989 \exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)\right)(-1)^{200}}{\sqrt{200-\frac{1}{24}} (2\pi)} + e^{0.943\sqrt{200}} =$$

$$\frac{0.0881989 \exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{\sqrt{200-\frac{1}{24}} (2\pi\sqrt{2})} +$$

$$\frac{\left(0.0881989 \exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)\right)(-1)^{200}}{\sqrt{200-\frac{1}{24}} (2\pi)} + w^a \text{ for } a = \frac{13.336}{\log(w)}$$

$$\begin{aligned}
& \frac{0.0881989 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\sqrt{200 - \frac{1}{24}} (2\pi \sqrt{2})} + \\
& \frac{\left(0.0881989 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)\right) (-1)^{200}}{\sqrt{200 - \frac{1}{24}} (2\pi)} + e^{0.943 \sqrt{200}} = \\
& \frac{0.0881989 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\sqrt{200 - \frac{1}{24}} (2\pi \sqrt{2})} + \\
& \frac{\left(0.0881989 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)\right) (-1)^{200}}{\sqrt{200 - \frac{1}{24}} (2\pi)} + z^{0.943 \sqrt{200}} \text{ for } z = e
\end{aligned}$$

$$\begin{aligned}
& \frac{0.0881989 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\sqrt{200 - \frac{1}{24}} (2\pi \sqrt{2})} + \\
& \frac{\left(0.0881989 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)\right) (-1)^{200}}{\sqrt{200 - \frac{1}{24}} (2\pi)} + e^{0.943 \sqrt{200}} = \\
& 1 + \frac{2}{-1 + \coth(0.4715 \sqrt{200})} + \frac{0.0881989 \exp\left(\frac{1}{2} \pi \sqrt{\frac{2}{3}} \sqrt{200 - \frac{1}{24}}\right) (-1)^{200}}{(2\pi) \sqrt{200 - \frac{1}{24}}} + \\
& \frac{0.0881989 \exp\left(\pi \sqrt{\frac{2}{3}} \sqrt{200 - \frac{1}{24}}\right)}{(2\pi \sqrt{2}) \sqrt{200 - \frac{1}{24}}}
\end{aligned}$$

p(100):

$$\left(\frac{1}{(2\text{Pisqrt}2)*0.123278387713*(\exp((\text{Pisqrt}(2/3))\text{sqrt}(100-1/24)))/(\text{sqrt}(100-1/24)))+((-1)^{100})/(2\text{Pi})*0.123278387713*\exp((((1/2(\text{Pisqrt}(2/3)))\text{sqrt}(100-1/24)))))/(\text{sqrt}(100-1/24))+(e^{(0.943\text{sqrt}(100))})\right)$$

Input interpretation

$$\frac{1}{2\pi\sqrt{2}} \times 0.1232715 \times \frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{100-\frac{1}{24}}\right)}{\sqrt{100-\frac{1}{24}}} + \frac{(-1)^{100}}{2\pi} \times 0.1232715 \times \frac{\exp\left(\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\right)\sqrt{100-\frac{1}{24}}\right)}{\sqrt{100-\frac{1}{24}}} + e^{0.943\sqrt{100}}$$

Result

$$1.905696... \times 10^8$$

$$1.905696... * 10^8 \approx p(100)$$

Alternative representations

$$\begin{aligned}
& \frac{0.123272 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{100 - \frac{1}{24}}\right)}{\sqrt{100 - \frac{1}{24}} (2\pi \sqrt{2})} + \\
& \frac{\left(0.123272 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{100 - \frac{1}{24}}\right)\right) (-1)^{100}}{\sqrt{100 - \frac{1}{24}} (2\pi)} + e^{0.943 \sqrt{100}} = \\
& \frac{0.123272 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{100 - \frac{1}{24}}\right)}{\sqrt{100 - \frac{1}{24}} (2\pi \sqrt{2})} + \\
& \frac{\left(0.123272 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{100 - \frac{1}{24}}\right)\right) (-1)^{100}}{\sqrt{100 - \frac{1}{24}} (2\pi)} + w^a \text{ for } a = \frac{9.43}{\log(w)}
\end{aligned}$$

$$\begin{aligned}
& \frac{0.123272 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{100 - \frac{1}{24}}\right)}{\sqrt{100 - \frac{1}{24}} (2\pi \sqrt{2})} + \\
& \frac{\left(0.123272 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{100 - \frac{1}{24}}\right)\right) (-1)^{100}}{\sqrt{100 - \frac{1}{24}} (2\pi)} + e^{0.943 \sqrt{100}} = \\
& \frac{0.123272 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{100 - \frac{1}{24}}\right)}{\sqrt{100 - \frac{1}{24}} (2\pi \sqrt{2})} + \\
& \frac{\left(0.123272 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{100 - \frac{1}{24}}\right)\right) (-1)^{100}}{\sqrt{100 - \frac{1}{24}} (2\pi)} + z^{0.943 \sqrt{100}} \text{ for } z = e
\end{aligned}$$

$$\begin{aligned}
& \frac{0.123272 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{100 - \frac{1}{24}}\right)}{\sqrt{100 - \frac{1}{24}} (2\pi \sqrt{2})} + \\
& \frac{\left(0.123272 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{100 - \frac{1}{24}}\right)\right) (-1)^{100}}{\sqrt{100 - \frac{1}{24}} (2\pi)} + e^{0.943 \sqrt{100}} = \\
& 1 + \frac{2}{-1 + \coth(0.4715 \sqrt{100})} + \frac{0.123272 \exp\left(\frac{1}{2} \pi \sqrt{\frac{2}{3}} \sqrt{100 - \frac{1}{24}}\right) (-1)^{100}}{(2\pi) \sqrt{100 - \frac{1}{24}}} + \\
& \frac{0.123272 \exp\left(\pi \sqrt{\frac{2}{3}} \sqrt{100 - \frac{1}{24}}\right)}{(2\pi \sqrt{2}) \sqrt{100 - \frac{1}{24}}}
\end{aligned}$$

p(50):

$$\begin{aligned}
& (1/(2\text{Pisqrt}2)*0.171318562395*(\exp((\text{Pisqrt}(2/3))\text{sqrt}(50-1/24))/(\text{sqrt}(50-1/24))))+((- \\
& 1)^50)/(2\text{Pi})*0.171318562395*\exp((((1/2(\text{Pisqrt}(2/3)))\text{sqrt}(50-1/24))))/(\text{sqrt}(50- \\
& 1/24)))+(e^{(0.943\text{sqrt}(50))}))
\end{aligned}$$

Input interpretation

$$\frac{1}{2\pi\sqrt{2}} \times 0.170771 \times \frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{50-\frac{1}{24}}\right)}{\sqrt{50-\frac{1}{24}}} +$$

$$\frac{(-1)^{50}}{2\pi} \times 0.170771 \times \frac{\exp\left(\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\right)\sqrt{50-\frac{1}{24}}\right)}{\sqrt{50-\frac{1}{24}}} + e^{0.943\sqrt{50}}$$

Result

$$2.04226... \times 10^5$$

$$2.04226... * 10^5 = p(50)$$

Alternative representations

$$\frac{0.170771 \exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{50-\frac{1}{24}}\right)}{\sqrt{50-\frac{1}{24}} (2\pi\sqrt{2})} +$$

$$\frac{\left(0.170771 \exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{50-\frac{1}{24}}\right)\right)(-1)^{50}}{\sqrt{50-\frac{1}{24}} (2\pi)} + e^{0.943\sqrt{50}} =$$

$$\frac{0.170771 \exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{50-\frac{1}{24}}\right)}{\sqrt{50-\frac{1}{24}} (2\pi\sqrt{2})} +$$

$$\frac{\left(0.170771 \exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{50-\frac{1}{24}}\right)\right)(-1)^{50}}{\sqrt{50-\frac{1}{24}} (2\pi)} + w^a \text{ for } a = \frac{6.66802}{\log(w)}$$

$$\begin{aligned}
& \frac{0.170771 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{50 - \frac{1}{24}}\right)}{\sqrt{50 - \frac{1}{24}} (2\pi \sqrt{2})} + \\
& \frac{\left(0.170771 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{50 - \frac{1}{24}}\right)\right) (-1)^{50}}{\sqrt{50 - \frac{1}{24}} (2\pi)} + e^{0.943 \sqrt{50}} = \\
& \frac{0.170771 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{50 - \frac{1}{24}}\right)}{\sqrt{50 - \frac{1}{24}} (2\pi \sqrt{2})} + \\
& \frac{\left(0.170771 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{50 - \frac{1}{24}}\right)\right) (-1)^{50}}{\sqrt{50 - \frac{1}{24}} (2\pi)} + z^{0.943 \sqrt{50}} \text{ for } z = e
\end{aligned}$$

$$\begin{aligned}
& \frac{0.170771 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{50 - \frac{1}{24}}\right)}{\sqrt{50 - \frac{1}{24}} (2\pi \sqrt{2})} + \\
& \frac{\left(0.170771 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{50 - \frac{1}{24}}\right)\right) (-1)^{50}}{\sqrt{50 - \frac{1}{24}} (2\pi)} + e^{0.943 \sqrt{50}} = \\
& 1 + \frac{2}{-1 + \coth(0.4715 \sqrt{50})} + \frac{0.170771 \exp\left(\frac{1}{2} \pi \sqrt{\frac{2}{3}} \sqrt{50 - \frac{1}{24}}\right) (-1)^{50}}{(2\pi) \sqrt{50 - \frac{1}{24}}} + \\
& \frac{0.170771 \exp\left(\pi \sqrt{\frac{2}{3}} \sqrt{50 - \frac{1}{24}}\right)}{(2\pi \sqrt{2}) \sqrt{50 - \frac{1}{24}}}
\end{aligned}$$

p(25):

$(1/(2\text{Pisqrt}2)*0.233831214549*(\exp((\text{Pisqrt}(2/3))\text{sqrt}(25-1/24))/(\text{sqrt}(25-1/24)))+((-1)^{25})/(2\text{Pi})*0.233831214549*\exp((((1/2(\text{Pisqrt}(2/3)))\text{sqrt}(25-1/24)))))/(\text{sqrt}(25-1/24)))+(e^{(0.943\text{sqrt}(25))}))$

Input interpretation

$$\frac{1}{2\pi\sqrt{2}} \times 0.223481 \times \frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{25-\frac{1}{24}}\right)}{\sqrt{25-\frac{1}{24}}} + \frac{(-1)^{25}}{2\pi} \times 0.223481 \times \frac{\exp\left(\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\right)\sqrt{25-\frac{1}{24}}\right)}{\sqrt{25-\frac{1}{24}}} + e^{0.943\sqrt{25}}$$

Result

1958.00...

1958 = p(25)

Alternative representations

$$\begin{aligned}
& \frac{0.223481 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{25 - \frac{1}{24}}\right)}{\sqrt{25 - \frac{1}{24}} (2\pi \sqrt{2})} + \\
& \frac{\left(0.223481 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{25 - \frac{1}{24}}\right)\right) (-1)^{25}}{\sqrt{25 - \frac{1}{24}} (2\pi)} + e^{0.943 \sqrt{25}} = \\
& \frac{0.223481 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{25 - \frac{1}{24}}\right)}{\sqrt{25 - \frac{1}{24}} (2\pi \sqrt{2})} + \\
& \frac{\left(0.223481 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{25 - \frac{1}{24}}\right)\right) (-1)^{25}}{\sqrt{25 - \frac{1}{24}} (2\pi)} + w^a \text{ for } a = \frac{4.715}{\log(w)}
\end{aligned}$$

$$\begin{aligned}
& \frac{0.223481 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{25 - \frac{1}{24}}\right)}{\sqrt{25 - \frac{1}{24}} (2\pi \sqrt{2})} + \\
& \frac{\left(0.223481 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{25 - \frac{1}{24}}\right)\right) (-1)^{25}}{\sqrt{25 - \frac{1}{24}} (2\pi)} + e^{0.943 \sqrt{25}} = \\
& \frac{0.223481 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{25 - \frac{1}{24}}\right)}{\sqrt{25 - \frac{1}{24}} (2\pi \sqrt{2})} + \\
& \frac{\left(0.223481 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{25 - \frac{1}{24}}\right)\right) (-1)^{25}}{\sqrt{25 - \frac{1}{24}} (2\pi)} + z^{0.943 \sqrt{25}} \text{ for } z = e
\end{aligned}$$

$$\begin{aligned}
& \frac{0.223481 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{25 - \frac{1}{24}}\right)}{\sqrt{25 - \frac{1}{24}} (2\pi \sqrt{2})} + \\
& \frac{\left(0.223481 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{25 - \frac{1}{24}}\right)\right) (-1)^{25}}{\sqrt{25 - \frac{1}{24}} (2\pi)} + e^{0.943 \sqrt{25}} = \\
& 1 + \frac{2}{-1 + \coth(0.4715 \sqrt{25})} + \frac{0.223481 \exp\left(\frac{1}{2} \pi \sqrt{\frac{2}{3}} \sqrt{25 - \frac{1}{24}}\right) (-1)^{25}}{(2\pi) \sqrt{25 - \frac{1}{24}}} + \\
& \frac{0.223481 \exp\left(\pi \sqrt{\frac{2}{3}} \sqrt{25 - \frac{1}{24}}\right)}{(2\pi \sqrt{2}) \sqrt{25 - \frac{1}{24}}}
\end{aligned}$$

From the mean between the following terms:

0.0881989 ; 0.1232715 ; 0.1232715 ; 0.170771 ; 0.170771 ; 0.223481

we obtain:

$$1/3((0.0881989 / 0.1232715) + (0.1232715 / 0.170771) + (0.170771 / 0.223481))$$

Input interpretation

$$\frac{1}{3} \left(\frac{0.0881989}{0.1232715} + \frac{0.1232715}{0.170771} + \frac{0.170771}{0.223481} \right)$$

Result

0.7338262017354096555810768381861844365982156425855233756232006595

...

0.7338262017....

Or, we have also:

$((1/(2\text{Pisqrt}2)(\exp((\text{Pisqrt}(2/3))\text{sqrt}(200-1/24))/(\text{sqrt}(200-1/24)))+((-1)^{200})/(2\text{Pi})\exp((((1/2(\text{Pisqrt}(2/3)))\text{sqrt}(200-1/24)))))/(\text{sqrt}(200-1/24)))+(e^{(0.943\text{sqrt}(200))})) 1/(200*0.0566900535672)$

Input interpretation

$$\left(\frac{1}{2\pi\sqrt{2}} \times \frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{\sqrt{200-\frac{1}{24}}} + \frac{(-1)^{200}}{2\pi} \times \frac{\exp\left(\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\right)\sqrt{200-\frac{1}{24}}\right)}{\sqrt{200-\frac{1}{24}}} + e^{0.943\sqrt{200}} \right) \times \frac{1}{200 \times 0.0566900535672}$$

Result

$3.97299902939058180926042309342245927743729519978577010743331... \times 10^{12}$

$3.972999029... \times 10^{12} \approx p(200)$

Alternative representations

$$\frac{\frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{(2\pi\sqrt{2})\sqrt{200-\frac{1}{24}}} + \frac{(-1)^{200}\exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{(2\pi)\sqrt{200-\frac{1}{24}}} + e^{0.943\sqrt{200}}}{200 \times 0.05669005356720000} = \frac{\frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{(2\pi\sqrt{2})\sqrt{200-\frac{1}{24}}} + \frac{(-1)^{200}\exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{(2\pi)\sqrt{200-\frac{1}{24}}} + w^a}{200 \times 0.05669005356720000} \text{ for } a = \frac{13.336}{\log(w)}$$

$$\frac{\frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{(2\pi\sqrt{2})\sqrt{200-\frac{1}{24}}} + \frac{(-1)^{200}\exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{(2\pi)\sqrt{200-\frac{1}{24}}} + e^{0.943\sqrt{200}}}{200 \times 0.05669005356720000} =$$

$$1 + \frac{2}{-1 + \coth(0.4715\sqrt{200})} + \frac{\exp\left(\frac{1}{2}\pi\sqrt{\frac{2}{3}}\sqrt{200-\frac{1}{24}}\right)(-1)^{200}}{(2\pi)\sqrt{200-\frac{1}{24}}} + \frac{\exp\left(\pi\sqrt{\frac{2}{3}}\sqrt{200-\frac{1}{24}}\right)}{(2\pi\sqrt{2})\sqrt{200-\frac{1}{24}}}$$

11.33801071344000

$$\frac{\frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{(2\pi\sqrt{2})\sqrt{200-\frac{1}{24}}} + \frac{(-1)^{200}\exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{(2\pi)\sqrt{200-\frac{1}{24}}} + e^{0.943\sqrt{200}}}{200 \times 0.05669005356720000} =$$

$$\frac{\frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{(2\pi\sqrt{2})\sqrt{200-\frac{1}{24}}} + \frac{(-1)^{200}\exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{(2\pi)\sqrt{200-\frac{1}{24}}} + z^{0.943\sqrt{200}}}{200 \times 0.05669005356720000} \quad \text{for } z = e$$

$$((1/(2\text{Pisqrt}2)*(\exp((\text{Pisqrt}(2/3))\text{sqrt}(100-1/24)))/(\text{sqrt}(100-1/24)))+((-1)^{100})/(2\text{Pi})*\exp((((1/2(\text{Pisqrt}(2/3)))\text{sqrt}(100-1/24))))/(\text{sqrt}(100-1/24)))+(e^{(0.943\text{sqrt}(100))})))* 1/(100*0.0811172)$$

Input interpretation

$$\left(\frac{1}{2\pi\sqrt{2}} \times \frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{100-\frac{1}{24}}\right)}{\sqrt{100-\frac{1}{24}}} + \frac{(-1)^{100}}{2\pi} \times \frac{\exp\left(\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\right)\sqrt{100-\frac{1}{24}}\right)}{\sqrt{100-\frac{1}{24}}} + e^{0.943\sqrt{100}} \right) \times \frac{1}{100 \times 0.0811172}$$

Result

$$1.90569337124624187385102551495222450341412171714980259009919... \times 10^8$$

$$1.9056933712... * 10^8 \approx p(100)$$

Alternative representations

$$\frac{\frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{100-\frac{1}{24}}\right)}{(2\pi\sqrt{2})\sqrt{100-\frac{1}{24}}} + \frac{(-1)^{100}\exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{100-\frac{1}{24}}\right)}{(2\pi)\sqrt{100-\frac{1}{24}}} + e^{0.943\sqrt{100}}}{100 \times 0.0811172} =$$

$$\frac{\frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{100-\frac{1}{24}}\right)}{(2\pi\sqrt{2})\sqrt{100-\frac{1}{24}}} + \frac{(-1)^{100}\exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{100-\frac{1}{24}}\right)}{(2\pi)\sqrt{100-\frac{1}{24}}} + w^a}{100 \times 0.0811172} \quad \text{for } a = \frac{9.43}{\log(w)}$$

$$\frac{\frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{100-\frac{1}{24}}\right)}{(2\pi\sqrt{2})\sqrt{100-\frac{1}{24}}} + \frac{(-1)^{100}\exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{100-\frac{1}{24}}\right)}{(2\pi)\sqrt{100-\frac{1}{24}}} + e^{0.943\sqrt{100}}}{100 \times 0.0811172} =$$

$$1 + \frac{2}{-1 + \coth(0.4715\sqrt{100})} + \frac{\exp\left(\frac{1}{2}\pi\sqrt{\frac{2}{3}}\sqrt{100-\frac{1}{24}}\right)(-1)^{100}}{(2\pi)\sqrt{100-\frac{1}{24}}} + \frac{\exp\left(\pi\sqrt{\frac{2}{3}}\sqrt{100-\frac{1}{24}}\right)}{(2\pi\sqrt{2})\sqrt{100-\frac{1}{24}}}$$

$$8.11172$$

$$\frac{\frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{100-\frac{1}{24}}\right)}{(2\pi\sqrt{2})\sqrt{100-\frac{1}{24}}} + \frac{(-1)^{100}\exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{100-\frac{1}{24}}\right)}{(2\pi)\sqrt{100-\frac{1}{24}}} + e^{0.943\sqrt{100}}}{100 \times 0.0811172} =$$

$$\frac{\frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{100-\frac{1}{24}}\right)}{(2\pi\sqrt{2})\sqrt{100-\frac{1}{24}}} + \frac{(-1)^{100}\exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{100-\frac{1}{24}}\right)}{(2\pi)\sqrt{100-\frac{1}{24}}} + z^{0.943\sqrt{100}}}{100 \times 0.0811172} \quad \text{for } z = e$$

$((1/(2\text{Pisqrt}2)*(\exp((\text{Pisqrt}(2/3))\text{sqrt}(50-1/24))/(\text{sqrt}(50-1/24))))+((-1)^{50})/(2\text{Pi})*\exp((((1/2(\text{Pisqrt}(2/3))\text{sqrt}(50-1/24)))))/(\text{sqrt}(50-1/24)))+(e^{(0.943\text{sqrt}(50))})) * 1/(50*0.116742)$

Input interpretation

$$\left(\frac{1}{2\pi\sqrt{2}} \times \frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{50-\frac{1}{24}}\right)}{\sqrt{50-\frac{1}{24}}} + \frac{(-1)^{50}}{2\pi} \times \frac{\exp\left(\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\right)\sqrt{50-\frac{1}{24}}\right)}{\sqrt{50-\frac{1}{24}}} + e^{0.943\sqrt{50}} \right) \times \frac{1}{50 \times 0.116742}$$

Result

204225.26735099206130140656510581776468791960739914232794892572773

...

$204225.26735\dots \approx p(50)$

Alternative representations

$$\frac{\frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{50-\frac{1}{24}}\right)}{(2\pi\sqrt{2})\sqrt{50-\frac{1}{24}}} + \frac{(-1)^{50}\exp\left(\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\right)\sqrt{50-\frac{1}{24}}\right)}{(2\pi)\sqrt{50-\frac{1}{24}}} + e^{0.943\sqrt{50}}}{50 \times 0.116742} = \frac{\frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{50-\frac{1}{24}}\right)}{(2\pi\sqrt{2})\sqrt{50-\frac{1}{24}}} + \frac{(-1)^{50}\exp\left(\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\right)\sqrt{50-\frac{1}{24}}\right)}{(2\pi)\sqrt{50-\frac{1}{24}}} + w^a}{50 \times 0.116742} \text{ for } a = \frac{6.66802}{\log(w)}$$

$$\frac{\frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{50-\frac{1}{24}}\right)}{(2\pi\sqrt{2})\sqrt{50-\frac{1}{24}}} + \frac{(-1)^{50}\exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{50-\frac{1}{24}}\right)}{(2\pi)\sqrt{50-\frac{1}{24}}} + e^{0.943\sqrt{50}}}{5.8371} =$$

$$1 + \frac{2}{-1+\coth(0.4715\sqrt{50})} + \frac{\frac{\exp\left(\frac{1}{2}\pi\sqrt{\frac{2}{3}}\sqrt{50-\frac{1}{24}}\right)(-1)^{50}}{(2\pi)\sqrt{50-\frac{1}{24}}} + \frac{\exp\left(\pi\sqrt{\frac{2}{3}}\sqrt{50-\frac{1}{24}}\right)}{(2\pi\sqrt{2})\sqrt{50-\frac{1}{24}}}}{5.8371}$$

$$\frac{\frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{50-\frac{1}{24}}\right)}{(2\pi\sqrt{2})\sqrt{50-\frac{1}{24}}} + \frac{(-1)^{50}\exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{50-\frac{1}{24}}\right)}{(2\pi)\sqrt{50-\frac{1}{24}}} + e^{0.943\sqrt{50}}}{5.8371} =$$

$$\frac{\frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{50-\frac{1}{24}}\right)}{(2\pi\sqrt{2})\sqrt{50-\frac{1}{24}}} + \frac{(-1)^{50}\exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{50-\frac{1}{24}}\right)}{(2\pi)\sqrt{50-\frac{1}{24}}} + z^{0.943\sqrt{50}}}{5.8371} \text{ for } z = e$$

$$((1/(2\text{Pisqrt}2)*(\exp((\text{Pisqrt}(2/3))\text{sqrt}(25-1/24)))/(\text{sqrt}(25-1/24))))+((-1)^{25})/(2\text{Pi})*\exp((((1/2(\text{Pisqrt}(2/3))\text{sqrt}(25-1/24)))))/(\text{sqrt}(25-1/24)))+(e^{(0.943\text{sqrt}(25))})))* 1/(25*0.171064)$$

Input interpretation

$$\left(\frac{1}{2\pi\sqrt{2}} \times \frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{25-\frac{1}{24}}\right)}{\sqrt{25-\frac{1}{24}}} + \frac{(-1)^{25}}{2\pi} \times \frac{\exp\left(\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\right)\sqrt{25-\frac{1}{24}}\right)}{\sqrt{25-\frac{1}{24}}} + e^{0.943\sqrt{25}} \right) \times \frac{1}{25 \times 0.171064}$$

Result

1957.9949366578500980297579305575097744336179313577846860379482442

...

1957.994936.... $\approx p(25)$

Alternative representations

$$\frac{\frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{25-\frac{1}{24}}\right)}{(2\pi\sqrt{2})\sqrt{25-\frac{1}{24}}} + \frac{(-1)^{25}\exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{25-\frac{1}{24}}\right)}{(2\pi)\sqrt{25-\frac{1}{24}}} + e^{0.943\sqrt{25}}}{25 \times 0.171064} =$$

$$\frac{\frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{25-\frac{1}{24}}\right)}{(2\pi\sqrt{2})\sqrt{25-\frac{1}{24}}} + \frac{(-1)^{25}\exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{25-\frac{1}{24}}\right)}{(2\pi)\sqrt{25-\frac{1}{24}}} + w^a}{25 \times 0.171064} \text{ for } a = \frac{4.715}{\log(w)}$$

$$\frac{\frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{25-\frac{1}{24}}\right)}{(2\pi\sqrt{2})\sqrt{25-\frac{1}{24}}} + \frac{(-1)^{25}\exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{25-\frac{1}{24}}\right)}{(2\pi)\sqrt{25-\frac{1}{24}}} + e^{0.943\sqrt{25}}}{25 \times 0.171064} =$$

$$1 + \frac{2}{-1 + \coth(0.4715\sqrt{25})} + \frac{\exp\left(\frac{1}{2}\pi\sqrt{\frac{2}{3}}\sqrt{25-\frac{1}{24}}\right)(-1)^{25}}{(2\pi)\sqrt{25-\frac{1}{24}}} + \frac{\exp\left(\pi\sqrt{\frac{2}{3}}\sqrt{25-\frac{1}{24}}\right)}{(2\pi\sqrt{2})\sqrt{25-\frac{1}{24}}}$$

$$4.2766$$

$$\frac{\frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{25-\frac{1}{24}}\right)}{(2\pi\sqrt{2})\sqrt{25-\frac{1}{24}}} + \frac{(-1)^{25}\exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{25-\frac{1}{24}}\right)}{(2\pi)\sqrt{25-\frac{1}{24}}} + e^{0.943\sqrt{25}}}{25 \times 0.171064} =$$

$$\frac{\frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{25-\frac{1}{24}}\right)}{(2\pi\sqrt{2})\sqrt{25-\frac{1}{24}}} + \frac{(-1)^{25}\exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{25-\frac{1}{24}}\right)}{(2\pi)\sqrt{25-\frac{1}{24}}} + z^{0.943\sqrt{25}}}{25 \times 0.171064} \text{ for } z = e$$

From the mean of the following terms:

$$\frac{1}{3}(((1/(200 \times 0.0566900535672))/(1/(100 \times 0.0811172))) + ((1/(100 \times 0.0811172))/(1/(50 \times 0.116742)))+(1/(50 \times 0.116742))/(1/(25 \times 0.171064))))$$

Input interpretation

$$\frac{1}{3} \left(\frac{\frac{1}{200 \times 0.0566900535672}}{\frac{1}{100 \times 0.0811172}} + \frac{\frac{1}{100 \times 0.0811172}}{\frac{1}{50 \times 0.116742}} + \frac{\frac{1}{50 \times 0.116742}}{\frac{1}{25 \times 0.171064}} \right)$$

Result

0.7225638389155281867871331716637384785588054123177447167346600515

...

0.72256383891....

We have that:

$$x/0.72256383891 = 0.0881989$$

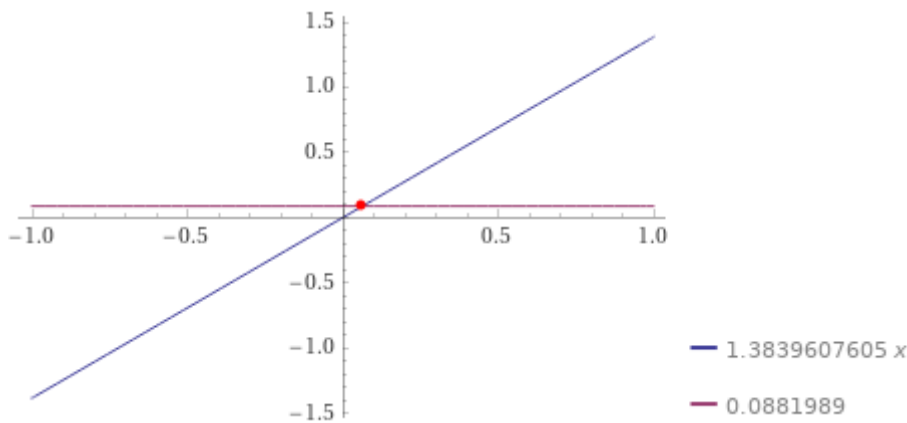
Input interpretation

$$\frac{x}{0.72256383891} = 0.0881989$$

Result

$$1.3839607605 \, x = 0.0881989$$

Plot



Alternate form

$$1.3839607605 x - 0.0881989 = 0$$

Solution

$$x \approx 0.0637293$$

$$0.0637293$$

Indeed, we have also:

$$\left(\frac{1}{2\pi\sqrt{2}} \left(\frac{0.06372924807}{0.722563} \right) \exp\left(\left(\pi \sqrt{\frac{2}{3}} \right) \sqrt{200 - \frac{1}{24}} \right) / \left(\sqrt{200 - \frac{1}{24}} \right) \right) + \frac{1}{2\pi} \left(\frac{0.06372924807}{0.722563} \right) \exp\left(\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}} \right) \sqrt{200 - \frac{1}{24}} \right) \right) / \left(\sqrt{200 - \frac{1}{24}} \right) + \left(e^{0.943\sqrt{200}} \right) \right)$$

Input interpretation

$$\frac{1}{2\pi\sqrt{2}} \times \frac{0.06372924807}{0.722563} \times \frac{\exp\left(\left(\pi \sqrt{\frac{2}{3}} \right) \sqrt{200 - \frac{1}{24}} \right)}{\sqrt{200 - \frac{1}{24}}} + \frac{1}{2\pi} \times \frac{0.06372924807}{0.722563} \times \frac{\exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}} \right) \sqrt{200 - \frac{1}{24}} \right)}{\sqrt{200 - \frac{1}{24}}} + e^{0.943\sqrt{200}}$$

Result

3.97299902962343222994161585961555874355465237980390768142503... $\times 10^{12}$

$$3.972999029623... \cdot 10^{12} \approx p(200)$$

Alternative representations

$$\begin{aligned} & \frac{0.0637292 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{200 - \frac{1}{24}}\right) (2\pi \sqrt{2})} + \frac{0.0637292 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{200 - \frac{1}{24}}\right) (2\pi)} + \\ & e^{0.943 \sqrt{200}} = \frac{0.0637292 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{200 - \frac{1}{24}}\right) (2\pi \sqrt{2})} + \\ & \frac{0.0637292 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{200 - \frac{1}{24}}\right) (2\pi)} + w^a \text{ for } a = \frac{13.336}{\log(w)} \end{aligned}$$

$$\begin{aligned} & \frac{0.0637292 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{200 - \frac{1}{24}}\right) (2\pi \sqrt{2})} + \frac{0.0637292 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{200 - \frac{1}{24}}\right) (2\pi)} + \\ & e^{0.943 \sqrt{200}} = \frac{0.0637292 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{200 - \frac{1}{24}}\right) (2\pi \sqrt{2})} + \\ & \frac{0.0637292 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{200 - \frac{1}{24}}\right) (2\pi)} + z^{0.943 \sqrt{200}} \text{ for } z = e \end{aligned}$$

$$\begin{aligned}
& \frac{0.0637292 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{200 - \frac{1}{24}}\right) (2\pi \sqrt{2})} + \\
& \frac{0.0637292 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{200 - \frac{1}{24}}\right) (2\pi)} + e^{0.943 \sqrt{200}} = \\
& 1 + \frac{2}{-1 + \coth(0.4715 \sqrt{200})} + \frac{0.0637292 \exp\left(\frac{1}{2} \pi \sqrt{\frac{2}{3}} \sqrt{200 - \frac{1}{24}}\right)}{0.722563 (2\pi) \sqrt{200 - \frac{1}{24}}} + \\
& \frac{0.0637292 \exp\left(\pi \sqrt{\frac{2}{3}} \sqrt{200 - \frac{1}{24}}\right)}{0.722563 (2\pi \sqrt{2}) \sqrt{200 - \frac{1}{24}}}
\end{aligned}$$

Series representations

$$\begin{aligned}
& \frac{0.0637292 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{200 - \frac{1}{24}}\right) (2\pi \sqrt{2})} + \\
& \frac{0.0637292 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{200 - \frac{1}{24}}\right) (2\pi)} + e^{0.943 \sqrt{200}} = \\
& \left(0.0440994 \exp\left(\pi \exp\left(i\pi \left\lfloor \frac{\arg\left(\frac{2}{3} - x\right)}{2\pi} \right\rfloor\right) \exp\left(i\pi \left\lfloor \frac{\arg\left(\frac{4799}{24} - x\right)}{2\pi} \right\rfloor\right) \sqrt{x}^2 \right. \\
& \quad \left. \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(\frac{2}{3} - x\right)^{k_1} \left(\frac{4799}{24} - x\right)^{k_2} x^{-k_1-k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2}}{k_1! k_2!} \right) + \\
& 0.0440994 \exp\left(i\pi \left\lfloor \frac{\arg(2-x)}{2\pi} \right\rfloor\right) \\
& \exp\left(\frac{1}{2} \pi \exp\left(i\pi \left\lfloor \frac{\arg\left(\frac{2}{3} - x\right)}{2\pi} \right\rfloor\right) \exp\left(i\pi \left\lfloor \frac{\arg\left(\frac{4799}{24} - x\right)}{2\pi} \right\rfloor\right) \sqrt{x}^2 \right. \\
& \quad \left. \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(\frac{2}{3} - x\right)^{k_1} \left(\frac{4799}{24} - x\right)^{k_2} x^{-k_1-k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2}}{k_1! k_2!} \right) \\
& \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (2-x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} + \\
& \pi \exp\left(i\pi \left\lfloor \frac{\arg(2-x)}{2\pi} \right\rfloor\right) \exp\left(i\pi \left\lfloor \frac{\arg\left(\frac{4799}{24} - x\right)}{2\pi} \right\rfloor\right) \sqrt{x}^2 \\
& \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \sum_{k_3=0}^{\infty} \frac{1}{k_1! k_2! k_3!} (-1)^{k_1+k_2} 0.943^{k_3} (2-x)^{k_1} \\
& \quad \left(\frac{4799}{24} - x\right)^{k_2} x^{-k_1-k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2} \sqrt{200}^{k_3} \Bigg) / \\
& \left(\pi \exp\left(i\pi \left\lfloor \frac{\arg(2-x)}{2\pi} \right\rfloor\right) \exp\left(i\pi \left\lfloor \frac{\arg\left(\frac{4799}{24} - x\right)}{2\pi} \right\rfloor\right) \sqrt{x}^2 \right. \\
& \quad \left(\sum_{k=0}^{\infty} \frac{(-1)^k (2-x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \\
& \quad \left. \sum_{k=0}^{\infty} \frac{(-1)^k \left(\frac{4799}{24} - x\right)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \text{ for } (x \in \mathbb{R} \text{ and } x < 0)
\end{aligned}$$

$$\begin{aligned}
& \frac{0.0637292 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{200 - \frac{1}{24}}\right) (2\pi \sqrt{2})} + \\
& \frac{0.0637292 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{200 - \frac{1}{24}}\right) (2\pi)} + e^{0.943 \sqrt{200}} = \\
& \left(0.0440994 \exp\left(\pi \exp\left(i\pi \left\lfloor \frac{\arg\left(\frac{2}{3} - x\right)}{2\pi} \right\rfloor\right) \exp\left(i\pi \left\lfloor \frac{\arg\left(\frac{4799}{24} - x\right)}{2\pi} \right\rfloor\right) \sqrt{x}^2 \right. \\
& \quad \left. \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(\frac{2}{3} - x\right)^{k_1} \left(\frac{4799}{24} - x\right)^{k_2} x^{-k_1-k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2}}{k_1! k_2!} \right) + \\
& 0.0440994 \exp\left(i\pi \left\lfloor \frac{\arg(2-x)}{2\pi} \right\rfloor\right) \\
& \exp\left(\frac{1}{2} \pi \exp\left(i\pi \left\lfloor \frac{\arg\left(\frac{2}{3} - x\right)}{2\pi} \right\rfloor\right) \exp\left(i\pi \left\lfloor \frac{\arg\left(\frac{4799}{24} - x\right)}{2\pi} \right\rfloor\right) \sqrt{x}^2 \right. \\
& \quad \left. \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(\frac{2}{3} - x\right)^{k_1} \left(\frac{4799}{24} - x\right)^{k_2} x^{-k_1-k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2}}{k_1! k_2!} \right) \\
& \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (2-x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} + \\
& \pi \exp\left(i\pi \left\lfloor \frac{\arg(2-x)}{2\pi} \right\rfloor\right) \exp\left(i\pi \left\lfloor \frac{\arg\left(\frac{4799}{24} - x\right)}{2\pi} \right\rfloor\right) \sqrt{x}^2 \\
& \sum_{k_1=-\infty}^{\infty} \sum_{k_2=0}^{\infty} \sum_{k_3=0}^{\infty} \frac{1}{k_2! k_3!} (-1)^{k_2+k_3} (2-x)^{k_2} \left(\frac{4799}{24} - x\right)^{k_3} \\
& \quad x^{-k_2-k_3} I_{k_1}(0.943 \sqrt{200}) \left(-\frac{1}{2}\right)_{k_2} \left(-\frac{1}{2}\right)_{k_3} \Big/ \\
& \left(\pi \exp\left(i\pi \left\lfloor \frac{\arg(2-x)}{2\pi} \right\rfloor\right) \exp\left(i\pi \left\lfloor \frac{\arg\left(\frac{4799}{24} - x\right)}{2\pi} \right\rfloor\right) \sqrt{x}^2 \right. \\
& \quad \left(\sum_{k=0}^{\infty} \frac{(-1)^k (2-x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \\
& \quad \left. \sum_{k=0}^{\infty} \frac{(-1)^k \left(\frac{4799}{24} - x\right)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \text{ for } (x \in \mathbb{R} \text{ and } x < 0)
\end{aligned}$$

$$\begin{aligned}
& \frac{0.0637292 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{200 - \frac{1}{24}}\right) (2\pi \sqrt{2})} + \\
& \frac{0.0637292 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{200 - \frac{1}{24}}\right) (2\pi)} + e^{0.943 \sqrt{200}} = \\
& \left(0.0440994 \exp\left(\pi \exp\left(i\pi \left\lfloor \frac{\arg\left(\frac{2}{3} - x\right)}{2\pi} \right\rfloor\right) \exp\left(i\pi \left\lfloor \frac{\arg\left(\frac{4799}{24} - x\right)}{2\pi} \right\rfloor\right) \sqrt{x}^2 \right. \\
& \quad \left. \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(\frac{2}{3} - x\right)^{k_1} \left(\frac{4799}{24} - x\right)^{k_2} x^{-k_1-k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2}}{k_1! k_2!} \right) + \\
& 0.0440994 \exp\left(i\pi \left\lfloor \frac{\arg(2-x)}{2\pi} \right\rfloor\right) \\
& \exp\left(\frac{1}{2} \pi \exp\left(i\pi \left\lfloor \frac{\arg\left(\frac{2}{3} - x\right)}{2\pi} \right\rfloor\right) \exp\left(i\pi \left\lfloor \frac{\arg\left(\frac{4799}{24} - x\right)}{2\pi} \right\rfloor\right) \sqrt{x}^2 \right. \\
& \quad \left. \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(\frac{2}{3} - x\right)^{k_1} \left(\frac{4799}{24} - x\right)^{k_2} x^{-k_1-k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2}}{k_1! k_2!} \right) \\
& \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (2-x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} + \\
& \pi \exp\left(i\pi \left\lfloor \frac{\arg(2-x)}{2\pi} \right\rfloor\right) \exp\left(i\pi \left\lfloor \frac{\arg\left(\frac{4799}{24} - x\right)}{2\pi} \right\rfloor\right) \sqrt{x}^2 \\
& \sum_{k_1=-\infty}^{\infty} \sum_{k_2=0}^{\infty} \sum_{k_3=0}^{\infty} \frac{1}{k_2! k_3!} (-1)^{k_1+k_2+k_3} (2-x)^{k_2} \left(\frac{4799}{24} - x\right)^{k_3} \\
& \quad x^{-k_2-k_3} I_{k_1}(-0.943 \sqrt{200}) \left(-\frac{1}{2}\right)_{k_2} \left(-\frac{1}{2}\right)_{k_3} \Big/ \\
& \left(\pi \exp\left(i\pi \left\lfloor \frac{\arg(2-x)}{2\pi} \right\rfloor\right) \exp\left(i\pi \left\lfloor \frac{\arg\left(\frac{4799}{24} - x\right)}{2\pi} \right\rfloor\right) \sqrt{x}^2 \right. \\
& \quad \left(\sum_{k=0}^{\infty} \frac{(-1)^k (2-x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \\
& \quad \left. \sum_{k=0}^{\infty} \frac{(-1)^k \left(\frac{4799}{24} - x\right)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \text{ for } (x \in \mathbb{R} \text{ and } x < 0)
\end{aligned}$$

For p(100):

$((1/(2\text{Pisqrt}2)(0.0890713/0.722563)(\exp((\text{Pisqrt}(2/3))\sqrt{100-1/24}))/(\sqrt{100-1/24}))+1/(2\text{Pi})(0.0890713/0.722563)\exp(((1/2(\text{Pisqrt}(2/3))\sqrt{100-1/24}))))/(\sqrt{100-1/24}))+(\text{e}^{(0.943\sqrt{100}))}))$

Input interpretation

$$\frac{1}{2\pi\sqrt{2}} \times \frac{0.0890713}{0.722563} \times \frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{100-\frac{1}{24}}\right)}{\sqrt{100-\frac{1}{24}}} +$$

$$\frac{1}{2\pi} \times \frac{0.0890713}{0.722563} \times \frac{\exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{100-\frac{1}{24}}\right)}{\sqrt{100-\frac{1}{24}}} + e^{0.943\sqrt{100}}$$

Result

1.90569298537944806781075427301158326782035908690123948527610... $\times 10^8$

$1.905692985... \times 10^8 \approx p(100)$

Alternative representations

$$\frac{0.0890713 \exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{100-\frac{1}{24}}\right)}{\left(0.722563\sqrt{100-\frac{1}{24}}\right)(2\pi\sqrt{2})} + \frac{0.0890713 \exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{100-\frac{1}{24}}\right)}{\left(0.722563\sqrt{100-\frac{1}{24}}\right)(2\pi)} +$$

$$e^{0.943\sqrt{100}} = \frac{0.0890713 \exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{100-\frac{1}{24}}\right)}{\left(0.722563\sqrt{100-\frac{1}{24}}\right)(2\pi\sqrt{2})} +$$

$$\frac{0.0890713 \exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{100-\frac{1}{24}}\right)}{\left(0.722563\sqrt{100-\frac{1}{24}}\right)(2\pi)} + w^a \text{ for } a = \frac{9.43}{\log(w)}$$

$$\begin{aligned}
& \frac{0.0890713 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{100 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{100 - \frac{1}{24}}\right) (2\pi \sqrt{2})} + \frac{0.0890713 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{100 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{100 - \frac{1}{24}}\right) (2\pi)} + \\
& e^{0.943 \sqrt{100}} = \frac{0.0890713 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{100 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{100 - \frac{1}{24}}\right) (2\pi \sqrt{2})} + \\
& \frac{0.0890713 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{100 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{100 - \frac{1}{24}}\right) (2\pi)} + z^{0.943 \sqrt{100}} \text{ for } z = e
\end{aligned}$$

$$\begin{aligned}
& \frac{0.0890713 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{100 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{100 - \frac{1}{24}}\right) (2\pi \sqrt{2})} + \\
& \frac{0.0890713 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{100 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{100 - \frac{1}{24}}\right) (2\pi)} + e^{0.943 \sqrt{100}} = \\
& 1 + \frac{2}{-1 + \coth(0.4715 \sqrt{100})} + \frac{0.0890713 \exp\left(\frac{1}{2} \pi \sqrt{\frac{2}{3}} \sqrt{100 - \frac{1}{24}}\right)}{0.722563 (2\pi) \sqrt{100 - \frac{1}{24}}} + \\
& \frac{0.0890713 \exp\left(\pi \sqrt{\frac{2}{3}} \sqrt{100 - \frac{1}{24}}\right)}{0.722563 (2\pi \sqrt{2}) \sqrt{100 - \frac{1}{24}}}
\end{aligned}$$

For p(50):

$$\left(\left(\frac{1}{2\pi\sqrt{2}} \right) \left(\frac{0.123393}{0.722563} \right) \exp\left(\left(\pi\sqrt{\frac{2}{3}} \right) \sqrt{50 - \frac{1}{24}} \right) / \left(\sqrt{50 - \frac{1}{24}} \right) \right) + \frac{1}{2\pi} \left(\frac{0.123393}{0.722563} \right) \exp\left(\left(\frac{1}{2} \left(\pi\sqrt{\frac{2}{3}} \right) \sqrt{50 - \frac{1}{24}} \right) \right) / \left(\sqrt{50 - \frac{1}{24}} \right) \right) + \left(e^{0.943\sqrt{50}} \right)$$

Input interpretation

$$\frac{1}{2\pi\sqrt{2}} \times \frac{0.123393}{0.722563} \times \frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}} \right) \sqrt{50 - \frac{1}{24}} \right)}{\sqrt{50 - \frac{1}{24}}} + \frac{1}{2\pi} \times \frac{0.123393}{0.722563} \times \frac{\exp\left(\frac{1}{2} \left(\pi\sqrt{\frac{2}{3}} \right) \sqrt{50 - \frac{1}{24}} \right)}{\sqrt{50 - \frac{1}{24}}} + e^{0.943\sqrt{50}}$$

Result

204226.04367036959907049559102006955611310341140145526469627882557

...

$$204226.04367036.... \approx p(50)$$

Alternative representations

$$\frac{0.123393 \exp\left(\left(\pi\sqrt{\frac{2}{3}} \right) \sqrt{50 - \frac{1}{24}} \right)}{\left(0.722563 \sqrt{50 - \frac{1}{24}} \right) (2\pi\sqrt{2})} + \frac{0.123393 \exp\left(\frac{1}{2} \left(\pi\sqrt{\frac{2}{3}} \right) \sqrt{50 - \frac{1}{24}} \right)}{\left(0.722563 \sqrt{50 - \frac{1}{24}} \right) (2\pi)} + e^{0.943\sqrt{50}} = \frac{0.123393 \exp\left(\left(\pi\sqrt{\frac{2}{3}} \right) \sqrt{50 - \frac{1}{24}} \right)}{\left(0.722563 \sqrt{50 - \frac{1}{24}} \right) (2\pi\sqrt{2})} + \frac{0.123393 \exp\left(\frac{1}{2} \left(\pi\sqrt{\frac{2}{3}} \right) \sqrt{50 - \frac{1}{24}} \right)}{\left(0.722563 \sqrt{50 - \frac{1}{24}} \right) (2\pi)} + w^a \text{ for } a = \frac{6.66802}{\log(w)}$$

$$\begin{aligned}
& \frac{0.123393 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{50 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{50 - \frac{1}{24}}\right) (2\pi \sqrt{2})} + \frac{0.123393 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{50 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{50 - \frac{1}{24}}\right) (2\pi)} + \\
& e^{0.943 \sqrt{50}} = \frac{0.123393 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{50 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{50 - \frac{1}{24}}\right) (2\pi \sqrt{2})} + \\
& \frac{0.123393 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{50 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{50 - \frac{1}{24}}\right) (2\pi)} + z^{0.943 \sqrt{50}} \quad \text{for } z = e
\end{aligned}$$

$$\begin{aligned}
& \frac{0.123393 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{50 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{50 - \frac{1}{24}}\right) (2\pi \sqrt{2})} + \frac{0.123393 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{50 - \frac{1}{24}}\right)}{\left(0.722563 \sqrt{50 - \frac{1}{24}}\right) (2\pi)} + \\
& e^{0.943 \sqrt{50}} = 1 + \frac{2}{-1 + \coth(0.4715 \sqrt{50})} + \\
& \frac{0.123393 \exp\left(\frac{1}{2} \pi \sqrt{\frac{2}{3}} \sqrt{50 - \frac{1}{24}}\right)}{0.722563 (2\pi) \sqrt{50 - \frac{1}{24}}} + \frac{0.123393 \exp\left(\pi \sqrt{\frac{2}{3}} \sqrt{50 - \frac{1}{24}}\right)}{0.722563 (2\pi \sqrt{2}) \sqrt{50 - \frac{1}{24}}}
\end{aligned}$$

We have that:

$$p(n) = \frac{1}{2\pi\sqrt{2}} \frac{d}{dn} \left(\frac{e^{C\lambda_n}}{\lambda_n} \right) + \frac{(-1)^n}{2\pi} \frac{d}{dn} \left(\frac{e^{\frac{1}{2}C\lambda_n}}{\lambda_n} \right) + O(e^{D\sqrt{n}}),$$

From which, we obtain:

$1/(2\pi\sqrt{2}) * (\text{partial derivative of } n) * ((e^{(C*\lambda)/(\lambda)})) + 1/(2\pi) * \text{partial derivative of } n$
 $((\exp(1/2*C*\lambda)/(\lambda))) + e^{(D*\sqrt{n})}$

Input interpretation

$$\frac{1}{2\pi\sqrt{2}} n'(n) \times \frac{e^{C\lambda}}{\lambda} + \frac{1}{2\pi} \times \frac{\partial}{\partial n} \left(n \times \frac{\exp\left(\frac{1}{2} C \lambda\right)}{\lambda} + e^{D\sqrt{n}} \right)$$

Result

$$\frac{\frac{e^{(C\lambda)/2}}{\lambda} + \frac{D e^{D\sqrt{n}}}{2\sqrt{n}}}{2\pi} + \frac{e^{C\lambda}}{2\sqrt{2}\pi\lambda}$$

Alternate forms

$$\frac{2 e^{(C\lambda)/2} + \sqrt{2} e^{C\lambda} + \frac{D\lambda e^{D\sqrt{n}}}{\sqrt{n}}}{4\pi\lambda}$$

$$\frac{2\sqrt{n} e^{(C\lambda)/2} + \sqrt{2}\sqrt{n} e^{C\lambda} + D\lambda e^{D\sqrt{n}}}{4\pi\lambda\sqrt{n}}$$

Series expansion at n=0

$$\frac{D}{4\pi\sqrt{n}} + \frac{2 e^{(C\lambda)/2} + \sqrt{2} e^{C\lambda} + D^2\lambda}{4\pi\lambda} + \frac{D^3\sqrt{n}}{8\pi} + \frac{D^4 n}{24\pi} + \frac{D^5 n^{3/2}}{96\pi} + \frac{D^6 n^2}{480\pi} + \frac{D^7 n^{5/2}}{2880\pi} + O(n^3)$$

(Puisseux series)

Derivative

$$\frac{\partial}{\partial n} \left(\frac{\frac{e^{(C\lambda)/2}}{\lambda} + \frac{D e^{D\sqrt{n}}}{2\sqrt{n}}}{2\pi} + \frac{e^{C\lambda}}{2\sqrt{2}\pi\lambda} \right) = \frac{D e^{D\sqrt{n}} (D\sqrt{n} - 1)}{8\pi n^{3/2}}$$

Indefinite integral

$$\int \left(\frac{\frac{D e^{D\sqrt{n}}}{2\sqrt{n}} + \frac{e^{(C\lambda)/2}}{\lambda}}{2\pi} + \frac{e^{C\lambda}}{2\sqrt{2}\pi\lambda} \right) dn = \frac{2n e^{(C\lambda)/2} + \sqrt{2} n e^{C\lambda} + 2\lambda e^{D\sqrt{n}}}{4\pi\lambda} + \text{constant}$$

From:

$$\frac{\frac{e^{(C\lambda)/2}}{\lambda} + \frac{D e^{D\sqrt{n}}}{2\sqrt{n}}}{2\pi} + \frac{e^{C\lambda}}{2\sqrt{2}\pi\lambda}$$

we obtain:

$$\begin{aligned} & (((e^{(((\text{Pisqrt}(2/3))\sqrt{200-1/24})))}/(\sqrt{200-1/24}))/2)/(\sqrt{200-1/24}))+ (0.943 \\ & e^{(0.943 \sqrt{200}))}/(2\sqrt{200}))/ (2\pi) + e^{(((\text{Pisqrt}(2/3))\sqrt{200-1/24})))}/(2\sqrt{2}\pi(\sqrt{200-1/24}))) \end{aligned}$$

Input

$$\frac{\frac{\frac{1}{2} \times \frac{e^{(\pi \sqrt{2/3}) \sqrt{200-1/24}}}{\sqrt{200-\frac{1}{24}}}}{\sqrt{200-\frac{1}{24}}} + \frac{0.943 e^{0.943 \sqrt{200}}}{2\sqrt{200}}}{2\pi} + \frac{e^{(\pi \sqrt{2/3}) \sqrt{200-1/24}}}{2\sqrt{2}\pi \sqrt{200-\frac{1}{24}}}$$

Result

$$4.72984339525761... \times 10^{13}$$

$$4.729843395... * 10^{13}$$

Series representations

$$\begin{aligned}
& \frac{\frac{e^{(\pi \sqrt{2/3}) \sqrt{200-1/24}}}{\sqrt{200-\frac{1}{24}} \sqrt{200-\frac{1}{24}} 2} + \frac{0.943 e^{0.943 \sqrt{200}}}{2 \sqrt{200}}}{2 \pi} + \frac{e^{\sqrt{200-1/24} \pi \sqrt{2/3}}}{2 \sqrt{2} \pi \sqrt{200-\frac{1}{24}}} = \\
& \left(0.5 \left(0.4715 \exp \left(0.943 \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (200-z_0)^k z_0^{-k}}{k!} \right) \right. \right. \\
& \quad \sqrt{z_0} \left(\sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (2-z_0)^k z_0^{-k}}{k!} \right) \\
& \quad \left. \left(\sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(\frac{4799}{24} - z_0\right)^k z_0^{-k}}{k!} \right)^2 + \right. \\
& \quad \left. 0.5 \exp \left(\pi \sqrt{z_0}^2 \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2} \left(\frac{2}{3} - z_0\right)^{k_1} \left(\frac{4799}{24} - z_0\right)^{k_2} z_0^{-k_1-k_2}}{k_1! k_2!} \right) \right. \\
& \quad \left. \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2} (2-z_0)^{k_1} (200-z_0)^{k_2} z_0^{-k_1-k_2}}{k_1! k_2!} + \right. \\
& \quad \left. \exp \left(\pi \sqrt{z_0}^2 \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2} \left(\frac{2}{3} - z_0\right)^{k_1} \left(\frac{4799}{24} - z_0\right)^{k_2} z_0^{-k_1-k_2}}{k_1! k_2!} \right) \right. \\
& \quad \left. \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2} \left(\frac{4799}{24} - z_0\right)^{k_1} (200-z_0)^{k_2} z_0^{-k_1-k_2}}{k_1! k_2!} \right) \Bigg) / \\
& \left(\pi \sqrt{z_0}^2 \left(\sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (2-z_0)^k z_0^{-k}}{k!} \right) \left(\sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(\frac{4799}{24} - z_0\right)^k z_0^{-k}}{k!} \right)^2 \right. \\
& \quad \left. \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (200-z_0)^k z_0^{-k}}{k!} \right) \text{ for (not } (z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \leq 0))
\end{aligned}$$

$$\begin{aligned}
& \frac{e^{(\pi \sqrt{2/3}) \sqrt{200-1/24}}}{\sqrt{200-\frac{1}{24}} \sqrt{200-\frac{1}{24}} 2} + \frac{0.943 e^{0.943 \sqrt{200}}}{2 \sqrt{200}} \\
& \frac{e^{\sqrt{200-1/24} \pi \sqrt{2/3}}}{2 \sqrt{2} \pi \sqrt{200-\frac{1}{24}}} = \\
& \left(0.5 \left(0.4715 e^{0.943 \exp\left(i \pi \left\lfloor \frac{\arg(200-x)}{2 \pi} \right\rfloor\right)} \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (200-x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right. \right. \\
& \quad \exp\left(i \pi \left\lfloor \frac{\arg(2-x)}{2 \pi} \right\rfloor\right) \exp^2\left(i \pi \left\lfloor \frac{\arg\left(\frac{4799}{24}-x\right)}{2 \pi} \right\rfloor\right) \\
& \quad \sqrt{x} \left(\sum_{k=0}^{\infty} \frac{(-1)^k (2-x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \\
& \quad \left(\sum_{k=0}^{\infty} \frac{(-1)^k \left(\frac{4799}{24}-x\right)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right)^2 + 0.5 \\
& \quad e^{\pi \exp\left(i \pi \left\lfloor \frac{\arg\left(\frac{2}{3}-x\right)}{2 \pi} \right\rfloor\right) \exp\left(i \pi \left\lfloor \frac{\arg\left(\frac{4799}{24}-x\right)}{2 \pi} \right\rfloor\right)} \sqrt{x}^2 \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(\frac{2}{3}-x\right)^{k_1} \left(\frac{4799}{24}-x\right)^{k_2} x^{-k_1-k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2}}{k_1! k_2!} \\
& \quad \exp\left(i \pi \left\lfloor \frac{\arg(2-x)}{2 \pi} \right\rfloor\right) \exp\left(i \pi \left\lfloor \frac{\arg(200-x)}{2 \pi} \right\rfloor\right) \\
& \quad \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} (2-x)^{k_1} (200-x)^{k_2} x^{-k_1-k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2}}{k_1! k_2!} + \\
& \quad e^{\pi \exp\left(i \pi \left\lfloor \frac{\arg\left(\frac{2}{3}-x\right)}{2 \pi} \right\rfloor\right) \exp\left(i \pi \left\lfloor \frac{\arg\left(\frac{4799}{24}-x\right)}{2 \pi} \right\rfloor\right)} \sqrt{x}^2 \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(\frac{2}{3}-x\right)^{k_1} \left(\frac{4799}{24}-x\right)^{k_2} x^{-k_1-k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2}}{k_1! k_2!} \\
& \quad \exp\left(i \pi \left\lfloor \frac{\arg\left(\frac{4799}{24}-x\right)}{2 \pi} \right\rfloor\right) \exp\left(i \pi \left\lfloor \frac{\arg(200-x)}{2 \pi} \right\rfloor\right) \\
& \quad \left. \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(\frac{4799}{24}-x\right)^{k_1} (200-x)^{k_2} x^{-k_1-k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2}}{k_1! k_2!} \right) \\
& \left. \right) / \left(\pi \exp\left(i \pi \left\lfloor \frac{\arg(2-x)}{2 \pi} \right\rfloor\right) \right. \\
& \quad \exp^2\left(i \pi \left\lfloor \frac{\arg\left(\frac{4799}{24}-x\right)}{2 \pi} \right\rfloor\right) \exp\left(i \pi \left\lfloor \frac{\arg(200-x)}{2 \pi} \right\rfloor\right) \sqrt{x}^2 \\
& \quad \left(\sum_{k=0}^{\infty} \frac{(-1)^k (2-x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \left(\sum_{k=0}^{\infty} \frac{(-1)^k \left(\frac{4799}{24}-x\right)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right)^2 \\
& \quad \left. \sum_{k=0}^{\infty} \frac{(-1)^k (200-x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \text{ for } (x \in \mathbb{R} \text{ and } x < 0)
\end{aligned}$$

$$\begin{aligned}
& \frac{e^{\left(\pi \sqrt{2/3}\right) \sqrt{200-1/24}}}{\sqrt{200-\frac{1}{24}} \sqrt{200-\frac{1}{24}}} + \frac{0.943 e^{0.943 \sqrt{200}}}{2 \sqrt{200}} \\
& \frac{e^{\sqrt{200-1/24} \pi \sqrt{2/3}}}{2 \sqrt{2} \pi \sqrt{200-\frac{1}{24}}} = \\
& \left(0.23575 \left(\frac{1}{z_0} \right)^{-1/2 [\arg(2-z_0)/(2\pi)] - [\arg(\frac{4799}{24} - z_0)/(2\pi)] - 1/2 [\arg(200-z_0)/(2\pi)]} \right. \\
& \quad \left. e^{\frac{-1-1/2 [\arg(2-z_0)/(2\pi)] - [\arg(\frac{4799}{24} - z_0)/(2\pi)] - 1/2 [\arg(200-z_0)/(2\pi)]}{z_0}} \right. \\
& \quad \left. e^{0.943 \left(\frac{1}{z_0} \right)^{1/2 [\arg(200-z_0)/(2\pi)]} \frac{1/2+1/2 [\arg(200-z_0)/(2\pi)]}{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2} \right)_k (200-z_0)^k z_0^{-k}}{k!}} \right. \\
& \quad \left(\frac{1}{z_0} \right)^{1/2 [\arg(2-z_0)/(2\pi)] + [\arg(\frac{4799}{24} - z_0)/(2\pi)]} \\
& \quad \frac{1/2+1/2 [\arg(2-z_0)/(2\pi)] + [\arg(\frac{4799}{24} - z_0)/(2\pi)]}{z_0} \\
& \quad \left(\sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2} \right)_k (2-z_0)^k z_0^{-k}}{k!} \right) \\
& \quad \left(\sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2} \right)_k \left(\frac{4799}{24} - z_0 \right)^k z_0^{-k}}{k!} \right)^2 + 1.06045 \\
& \quad e^{\pi \left(\frac{1}{z_0} \right)^{1/2 [\arg(\frac{2}{3} - z_0)/(2\pi)] + 1/2 [\arg(\frac{4799}{24} - z_0)/(2\pi)]} \frac{1+1/2 [\arg(\frac{2}{3} - z_0)/(2\pi)] + 1/2 [\arg(\frac{4799}{24} - z_0)/(2\pi)]}{z_0} \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(-\frac{1}{2} \right)_{k_1} \left(-\frac{1}{2} \right)_{k_2} \left(\frac{2}{3} - z_0 \right)^{k_1} \left(\frac{4799}{24} - z_0 \right)^{k_2} z_0^{-k_1-k_2}}{k_1! k_2!} \\
& \quad \left(\frac{1}{z_0} \right)^{1/2 [\arg(2-z_0)/(2\pi)] + 1/2 [\arg(200-z_0)/(2\pi)]} \\
& \quad \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(-\frac{1}{2} \right)_{k_1} \left(-\frac{1}{2} \right)_{k_2} (2-z_0)^{k_1} (200-z_0)^{k_2} z_0^{-k_1-k_2}}{k_1! k_2!} + \\
& 2.12089 \\
& \quad e^{\pi \left(\frac{1}{z_0} \right)^{1/2 [\arg(\frac{2}{3} - z_0)/(2\pi)] + 1/2 [\arg(\frac{4799}{24} - z_0)/(2\pi)]} \frac{1+1/2 [\arg(\frac{2}{3} - z_0)/(2\pi)] + 1/2 [\arg(\frac{4799}{24} - z_0)/(2\pi)]}{z_0} \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(-\frac{1}{2} \right)_{k_1} \left(-\frac{1}{2} \right)_{k_2} \left(\frac{2}{3} - z_0 \right)^{k_1} \left(\frac{4799}{24} - z_0 \right)^{k_2} z_0^{-k_1-k_2}}{k_1! k_2!} \\
& \quad \left(\frac{1}{z_0} \right)^{1/2 [\arg(\frac{4799}{24} - z_0)/(2\pi)] + 1/2 [\arg(200-z_0)/(2\pi)]} \\
& \quad \frac{1/2 [\arg(\frac{4799}{24} - z_0)/(2\pi)] + 1/2 [\arg(200-z_0)/(2\pi)]}{z_0} \\
& \quad \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(-\frac{1}{2} \right)_{k_1} \left(-\frac{1}{2} \right)_{k_2} \left(\frac{4799}{24} - z_0 \right)^{k_1} (200-z_0)^{k_2} z_0^{-k_1-k_2}}{k_1! k_2!} \Bigg) \\
& \quad / \left(\pi \left(\sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2} \right)_k (2-z_0)^k z_0^{-k}}{k!} \right) \right. \\
& \quad \left. \left(\sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2} \right)_k \left(\frac{4799}{24} - z_0 \right)^k z_0^{-k}}{k!} \right)^2 \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2} \right)_k (200-z_0)^k z_0^{-k}}{k!} \right)
\end{aligned}$$

From which:

1/11.9049699239(((e^(((Pisqrt(2/3))sqrt(200-1/24))))/(sqrt(200-1/24))/2)/(sqrt(200-1/24)))+(0.943 e^(0.943 sqrt(200)))/(2sqrt(200)))/(2π)+e^(((Pisqrt(2/3))sqrt(200-1/24)))/(2sqrt(2)π(sqrt(200-1/24)))

Input interpretation

$$\frac{1}{11.9049699239} \left(\frac{\frac{\frac{1}{2} \times e^{\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200-\frac{1}{24}}}}{\sqrt{200-\frac{1}{24}}} + \frac{0.943 e^{0.943 \sqrt{200}}}{2 \sqrt{200}}}{2 \pi} + \frac{e^{\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200-\frac{1}{24}}}}{2 \sqrt{2} \pi \sqrt{200-\frac{1}{24}}} \right)$$

Result

3.97299902939... $\times 10^{12}$

3.97299902939... $\times 10^{12} \approx p(200)$

Series representations

$$\begin{aligned}
& \frac{\frac{e^{\left(\pi \sqrt{2/3}\right) \sqrt{200-1/24}}}{\left(\sqrt{200-\frac{1}{24}}\right)^2 \sqrt{200-\frac{1}{24}}} + \frac{0.943 e^{0.943 \sqrt{200}}}{2 \sqrt{200}}}{2 \pi} + \frac{e^{\left(\pi \sqrt{2/3}\right) \sqrt{200-1/24}}}{2 \sqrt{2} \pi \sqrt{200-\frac{1}{24}}} = \\
& \frac{11.90496992390000}{\left(0.0419993 \left(0.4715 \exp \left(0.943 \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (200-z_0)^k z_0^{-k}}{k!}\right) \right.\right. \\
& \quad \left.\left. \sqrt{z_0} \left(\sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (2-z_0)^k z_0^{-k}}{k!}\right) \right.\right. \\
& \quad \left.\left. \left(\sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(\frac{4799}{24}-z_0\right)^k z_0^{-k}}{k!}\right)^2 + \right.\right. \\
& \quad \left.\left. 0.5 \exp \left(\pi \sqrt{z_0}^2 \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2} \left(\frac{2}{3}-z_0\right)^{k_1} \left(\frac{4799}{24}-z_0\right)^{k_2} z_0^{-k_1-k_2}}{k_1! k_2!}\right) \right.\right. \\
& \quad \left.\left. \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2} (2-z_0)^{k_1} (200-z_0)^{k_2} z_0^{-k_1-k_2}}{k_1! k_2!} + \right.\right. \\
& \quad \left.\left. \exp \left(\pi \sqrt{z_0}^2 \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2} \left(\frac{2}{3}-z_0\right)^{k_1} \left(\frac{4799}{24}-z_0\right)^{k_2} z_0^{-k_1-k_2}}{k_1! k_2!}\right) \right.\right. \\
& \quad \left.\left. \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2} \left(\frac{4799}{24}-z_0\right)^{k_1} (200-z_0)^{k_2} z_0^{-k_1-k_2}}{k_1! k_2!}\right) \right) \Bigg/ \\
& \quad \left(\pi \sqrt{z_0}^2 \left(\sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (2-z_0)^k z_0^{-k}}{k!}\right) \left(\sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(\frac{4799}{24}-z_0\right)^k z_0^{-k}}{k!}\right)^2 \right. \\
& \quad \left.\sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (200-z_0)^k z_0^{-k}}{k!}\right) \text{ for (not } (z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \leq 0))
\end{aligned}$$

$$\begin{aligned}
& \frac{e^{\left(\pi \sqrt{2/3}\right) \sqrt{200-1/24}}}{\left(\sqrt{200-\frac{1}{24}}\right)^2} + \frac{0.943 e^{0.943 \sqrt{200}}}{2 \sqrt{200}} \\
& \frac{\left(\sqrt{200-\frac{1}{24}}\right)^2 \sqrt{200-\frac{1}{24}}}{2 \pi} + \frac{e^{\left(\pi \sqrt{2/3}\right) \sqrt{200-1/24}}}{2 \sqrt{2} \pi \sqrt{200-\frac{1}{24}}} = \\
& 11.90496992390000 \\
& \left(0.0419993 \left(0.4715 e^{0.943 \exp\left(i \pi \left\lfloor \frac{\arg(200-x)}{2 \pi} \right\rfloor\right)} \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (200-x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right. \right. \\
& \exp\left(i \pi \left\lfloor \frac{\arg(2-x)}{2 \pi} \right\rfloor\right) \exp^2\left(i \pi \left\lfloor \frac{\arg\left(\frac{4799}{24}-x\right)}{2 \pi} \right\rfloor\right) \\
& \sqrt{x} \left(\sum_{k=0}^{\infty} \frac{(-1)^k (2-x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \\
& \left(\sum_{k=0}^{\infty} \frac{(-1)^k \left(\frac{4799}{24}-x\right)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right)^2 + 0.5 \\
& e^{\pi \exp\left(i \pi \left\lfloor \frac{\arg\left(\frac{2}{3}-x\right)}{2 \pi} \right\rfloor\right) \exp\left(i \pi \left\lfloor \frac{\arg\left(\frac{4799}{24}-x\right)}{2 \pi} \right\rfloor\right)} \sqrt{x}^2 \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(\frac{2}{3}-x\right)^{k_1} \left(\frac{4799}{24}-x\right)^{k_2} x^{-k_1-k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2}}{k_1! k_2!} \\
& \exp\left(i \pi \left\lfloor \frac{\arg(2-x)}{2 \pi} \right\rfloor\right) \exp\left(i \pi \left\lfloor \frac{\arg(200-x)}{2 \pi} \right\rfloor\right) \\
& \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} (2-x)^{k_1} (200-x)^{k_2} x^{-k_1-k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2}}{k_1! k_2!} + \\
& e^{\pi \exp\left(i \pi \left\lfloor \frac{\arg\left(\frac{2}{3}-x\right)}{2 \pi} \right\rfloor\right) \exp\left(i \pi \left\lfloor \frac{\arg\left(\frac{4799}{24}-x\right)}{2 \pi} \right\rfloor\right)} \sqrt{x}^2 \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(\frac{2}{3}-x\right)^{k_1} \left(\frac{4799}{24}-x\right)^{k_2} x^{-k_1-k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2}}{k_1! k_2!} \\
& \exp\left(i \pi \left\lfloor \frac{\arg\left(\frac{4799}{24}-x\right)}{2 \pi} \right\rfloor\right) \exp\left(i \pi \left\lfloor \frac{\arg(200-x)}{2 \pi} \right\rfloor\right) \\
& \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(\frac{4799}{24}-x\right)^{k_1} (200-x)^{k_2} x^{-k_1-k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2}}{k_1! k_2!} \Bigg) \\
& \Bigg/ \left(\pi \exp\left(i \pi \left\lfloor \frac{\arg(2-x)}{2 \pi} \right\rfloor\right) \right. \\
& \exp^2\left(i \pi \left\lfloor \frac{\arg\left(\frac{4799}{24}-x\right)}{2 \pi} \right\rfloor\right) \exp\left(i \pi \left\lfloor \frac{\arg(200-x)}{2 \pi} \right\rfloor\right) \sqrt{x}^2 \\
& \left(\sum_{k=0}^{\infty} \frac{(-1)^k (2-x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \left(\sum_{k=0}^{\infty} \frac{(-1)^k \left(\frac{4799}{24}-x\right)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right)^2 \\
& \left. \sum_{k=0}^{\infty} \frac{(-1)^k (200-x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \text{ for } (x \in \mathbb{R} \text{ and } x < 0)
\end{aligned}$$

$$\begin{aligned}
& \frac{\frac{e^{\left(\pi \sqrt{2/3}\right) \sqrt{200-1/24}}}{\left(\sqrt{200-\frac{1}{24}}\right)^2} + \frac{0.943 e^{0.943 \sqrt{200}}}{2 \sqrt{200}}}{2 \pi} + \frac{e^{\left(\pi \sqrt{2/3}\right) \sqrt{200-1/24}}}{2 \sqrt{2} \pi \sqrt{200-\frac{1}{24}}} = \\
& \frac{11.90496992390000}{\left(0.0198027 \left(\frac{1}{z_0}\right)^{-1/2 \lfloor \arg(2-z_0)/(2\pi) \rfloor - \lfloor \arg\left(\frac{4799}{24} - z_0\right)/(2\pi) \rfloor - 1/2 \lfloor \arg(200-z_0)/(2\pi) \rfloor} \right.} \\
& \left. z_0^{-1-1/2 \lfloor \arg(2-z_0)/(2\pi) \rfloor - \lfloor \arg\left(\frac{4799}{24} - z_0\right)/(2\pi) \rfloor - 1/2 \lfloor \arg(200-z_0)/(2\pi) \rfloor} \right. \\
& \left. e^{0.943 \left(\frac{1}{z_0}\right)^{1/2 \lfloor \arg(200-z_0)/(2\pi) \rfloor} z_0^{1/2+1/2 \lfloor \arg(200-z_0)/(2\pi) \rfloor} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (200-z_0)^k z_0^{-k}}{k!}} \right. \\
& \left. \left(\frac{1}{z_0}\right)^{1/2 \lfloor \arg(2-z_0)/(2\pi) \rfloor + \lfloor \arg\left(\frac{4799}{24} - z_0\right)/(2\pi) \rfloor} \right. \\
& \left. z_0^{1/2+1/2 \lfloor \arg(2-z_0)/(2\pi) \rfloor + \lfloor \arg\left(\frac{4799}{24} - z_0\right)/(2\pi) \rfloor} \right. \\
& \left. \left(\sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (2-z_0)^k z_0^{-k}}{k!}\right) \right. \\
& \left. \left(\sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(\frac{4799}{24} - z_0\right)^k z_0^{-k}}{k!}\right)^2 + 1.06045 \right. \\
& \left. e^{\pi \left(\frac{1}{z_0}\right)^{1/2 \lfloor \arg\left(\frac{2}{3} - z_0\right)/(2\pi) \rfloor + 1/2 \lfloor \arg\left(\frac{4799}{24} - z_0\right)/(2\pi) \rfloor} z_0^{1+1/2 \lfloor \arg\left(\frac{2}{3} - z_0\right)/(2\pi) \rfloor + 1/2 \lfloor \arg\left(\frac{4799}{24} - z_0\right)/(2\pi) \rfloor} \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2} \left(\frac{2}{3} - z_0\right)^{k_1} \left(\frac{4799}{24} - z_0\right)^{k_2} z_0^{-k_1-k_2}}{k_1! k_2!}} \right. \\
& \left. \left(\frac{1}{z_0}\right)^{1/2 \lfloor \arg(2-z_0)/(2\pi) \rfloor + 1/2 \lfloor \arg(200-z_0)/(2\pi) \rfloor} \right. \\
& \left. z_0^{1/2 \lfloor \arg(2-z_0)/(2\pi) \rfloor + 1/2 \lfloor \arg(200-z_0)/(2\pi) \rfloor} \right. \\
& \left. \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2} (2-z_0)^{k_1} (200-z_0)^{k_2} z_0^{-k_1-k_2}}{k_1! k_2!} + \right. \\
& 2.12089 \\
& \left. e^{\pi \left(\frac{1}{z_0}\right)^{1/2 \lfloor \arg\left(\frac{2}{3} - z_0\right)/(2\pi) \rfloor + 1/2 \lfloor \arg\left(\frac{4799}{24} - z_0\right)/(2\pi) \rfloor} z_0^{1+1/2 \lfloor \arg\left(\frac{2}{3} - z_0\right)/(2\pi) \rfloor + 1/2 \lfloor \arg\left(\frac{4799}{24} - z_0\right)/(2\pi) \rfloor} \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2} \left(\frac{2}{3} - z_0\right)^{k_1} \left(\frac{4799}{24} - z_0\right)^{k_2} z_0^{-k_1-k_2}}{k_1! k_2!}} \right. \\
& \left. \left(\frac{1}{z_0}\right)^{1/2 \lfloor \arg\left(\frac{4799}{24} - z_0\right)/(2\pi) \rfloor + 1/2 \lfloor \arg(200-z_0)/(2\pi) \rfloor} \right. \\
& \left. z_0^{1/2 \lfloor \arg\left(\frac{4799}{24} - z_0\right)/(2\pi) \rfloor + 1/2 \lfloor \arg(200-z_0)/(2\pi) \rfloor} \right. \\
& \left. \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2} \left(\frac{4799}{24} - z_0\right)^{k_1} (200-z_0)^{k_2} z_0^{-k_1-k_2}}{k_1! k_2!} \right) \Bigg) \\
& / \left(\pi \left(\sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (2-z_0)^k z_0^{-k}}{k!} \right) \right. \\
& \left. \left(\sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(\frac{4799}{24} - z_0\right)^k z_0^{-k}}{k!} \right)^2 \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (200-z_0)^k z_0^{-k}}{k!} \right)
\end{aligned}$$

Now, we have the following formula:

$$\frac{\sqrt{3}}{\pi\sqrt{2}} \cos\left(\frac{2}{3}n\pi - \frac{1}{18}\pi\right) \frac{d}{dn} \left(\frac{e^{\frac{1}{3}C\lambda_n}}{\lambda_n} \right)$$

We consider:

$$\text{Sqrt3}/(\text{Pi}*\text{sqrt2}) \cos(2/3*n*\text{Pi} - 1/18*\text{Pi}) (\text{derivative of } n * (((e^{(1/3*C*\lambda)})/\lambda)))$$

Input interpretation

$$\frac{\sqrt{3}}{\pi\sqrt{2}} \cos\left(\frac{2}{3}n\pi - \frac{1}{18}\pi\right) \times \frac{\partial}{\partial\lambda} \left(n \times \frac{e^{1/3C\lambda}}{\lambda} \right)$$

Result

$$\frac{n e^{(C\lambda)/3} (C\lambda - 3) \cos\left(\frac{\pi}{18} - \frac{2\pi n}{3}\right)}{\sqrt{6} \pi \lambda^2}$$

Alternate forms

$$\frac{n e^{(C\lambda)/3} (C\lambda - 3) \sin\left(\frac{2}{9}\pi (3n + 2)\right)}{\sqrt{6} \pi \lambda^2}$$

$$n e^{(C\lambda)/3} \left(\frac{C}{\sqrt{6} \pi \lambda} - \frac{\sqrt{\frac{3}{2}}}{\pi \lambda^2} \right) \cos\left(\frac{1}{18}\pi (12n - 1)\right)$$

$$\frac{(e^{(i\pi)/18 - (2i\pi n)/3} + e^{(2i\pi n)/3 - (i\pi)/18}) n e^{(C\lambda)/3} (C\lambda - 3)}{2\sqrt{6} \pi \lambda^2}$$

Expanded form

$$\frac{C n e^{(C\lambda)/3} \cos\left(\frac{\pi}{18} - \frac{2\pi n}{3}\right)}{\sqrt{6} \pi \lambda} - \frac{\sqrt{\frac{3}{2}} n e^{(C\lambda)/3} \cos\left(\frac{\pi}{18} - \frac{2\pi n}{3}\right)}{\pi \lambda^2}$$

Roots

$$\lambda \neq 0, \quad n = \frac{3m}{2} - \frac{2}{3}, \quad m \in \mathbb{Z}$$

$$C \neq 0, \quad \lambda = \frac{3}{C}$$

$$\lambda \neq 0, \quad n = 0$$

$\mathbb{Z}$ is the set of integers

Integer roots

$$C = 1, \quad \lambda = 3$$

$$C = 3, \quad \lambda = 1$$

$$C = -3, \quad \lambda = -1$$

$$C = -1, \quad \lambda = -3$$

Series expansion at n=0

$$\begin{aligned} & \frac{n \cos\left(\frac{\pi}{18}\right) e^{(C\lambda)/3} (C\lambda - 3)}{\sqrt{6} \pi \lambda^2} + \frac{\sqrt{\frac{2}{3}} n^2 \sin\left(\frac{\pi}{18}\right) e^{(C\lambda)/3} (C\lambda - 3)}{3 \lambda^2} - \\ & \frac{n^3 \left(\sqrt{\frac{2}{3}} \pi \cos\left(\frac{\pi}{18}\right) e^{(C\lambda)/3} (C\lambda - 3) \right)}{9 \lambda^2} - \frac{2 n^4 \left(\sqrt{\frac{2}{3}} \pi^2 \sin\left(\frac{\pi}{18}\right) e^{(C\lambda)/3} (C\lambda - 3) \right)}{81 \lambda^2} + \\ & \frac{\sqrt{\frac{2}{3}} \pi^3 n^5 \cos\left(\frac{\pi}{18}\right) e^{(C\lambda)/3} (C\lambda - 3)}{243 \lambda^2} + O(n^6) \end{aligned}$$

(Taylor series)

Derivative

$$\begin{aligned} & \frac{\partial}{\partial n} \left(\frac{n e^{(C\lambda)/3} (C\lambda - 3) \cos\left(\frac{\pi}{18} - \frac{2n\pi}{3}\right)}{\sqrt{6} \pi \lambda^2} \right) = \\ & \frac{e^{(C\lambda)/3} (C\lambda - 3) \left(3 \sin\left(\frac{2}{9} \pi (3n + 2)\right) + 2 \pi n \cos\left(\frac{2}{9} \pi (3n + 2)\right) \right)}{3 \sqrt{6} \pi \lambda^2} \end{aligned}$$

Indefinite integral

$$\begin{aligned} & \int \frac{e^{(C\lambda)/3} n (-3 + C\lambda) \cos\left(\frac{\pi}{18} - \frac{2n\pi}{3}\right)}{\sqrt{6} \pi \lambda^2} dn = \frac{1}{8 \pi^3 \lambda^2} \\ & (-1)^{5/9} \sqrt{\frac{3}{2}} e^{(C\lambda)/3} (C\lambda - 3) \left(\left(2 \left(1 + (-1)^{8/9} \right) \pi n - 3 \left((-1)^{7/18} + i \right) \right) \cos\left(\frac{2\pi n}{3}\right) - \right. \\ & \left. \left(3 \left(1 + (-1)^{8/9} \right) + 2 \left((-1)^{7/18} + i \right) \pi n \right) \sin\left(\frac{2\pi n}{3}\right) \right) + \text{constant} \end{aligned}$$

From:

$$\frac{n e^{(C\lambda)/3} (C\lambda - 3) \cos\left(\frac{\pi}{18} - \frac{2n\pi}{3}\right)}{\sqrt{6} \pi \lambda^2}$$

For $C\lambda = ((\text{Pisqrt}(2/3))\sqrt{200-1/24})$, we obtain:

$$\frac{((200 * e^{((((\text{Pisqrt}(2/3))\sqrt{200-1/24}))/3)}) * [((((\text{Pisqrt}(2/3))\sqrt{200-1/24}))-3]) * ((\cos(\pi/18 - 400\pi/3)))))) / (((\sqrt{6} * \pi * (\sqrt{200-1/24})^2))))$$

Input

$$\frac{200 \exp\left(\frac{1}{3} \left(\left(\pi \sqrt{\frac{2}{3}} \right) \sqrt{200 - \frac{1}{24}} \right) \left(\left(\left(\pi \sqrt{\frac{2}{3}} \right) \sqrt{200 - \frac{1}{24}} - 3 \right) \cos\left(\frac{\pi}{18} - 400 \times \frac{\pi}{3}\right) \right) \right)}{\sqrt{6} \pi \sqrt{200 - \frac{1}{24}}^2}$$

Exact result

$$-\frac{800 \sqrt{6} e^{(\sqrt{4799} \pi)/18} \left(\frac{\sqrt{4799} \pi}{6} - 3 \right) \sin\left(\frac{2\pi}{9}\right)}{4799 \pi}$$

Decimal approximation

-495397.8177060974562938770109524051950958047981077062506058478184
...

-495397.81770609....

Alternate forms

$$-\frac{400 \sqrt{\frac{2}{3}} e^{(\sqrt{4799} \pi)/18} (\sqrt{4799} \pi - 18) \sin\left(\frac{2\pi}{9}\right)}{4799 \pi}$$

$$-\frac{800 \sqrt{\frac{2}{3}} e^{(\sqrt{4799} \pi)/18} (\sqrt{4799} \pi - 18) \sin\left(\frac{\pi}{9}\right) \cos\left(\frac{\pi}{9}\right)}{4799 \pi}$$

$$e^{(\sqrt{4799} \pi)/18} \left(\frac{2400 \sqrt{6} \sin\left(\frac{2\pi}{9}\right)}{4799 \pi} - 400 \sqrt{\frac{2}{14397}} \sin\left(\frac{2\pi}{9}\right) \right)$$

Expanded form

$$\frac{2400 \sqrt{6} e^{(\sqrt{4799} \pi)/18} \sin\left(\frac{2\pi}{9}\right)}{4799 \pi} - 400 \sqrt{\frac{2}{14397}} e^{(\sqrt{4799} \pi)/18} \sin\left(\frac{2\pi}{9}\right)$$

Alternative representations

$$\frac{200 \left(e^{1/3 (\pi \sqrt{2/3}) \sqrt{200-1/24}} \left(\left(\left(\pi \sqrt{\frac{2}{3}} \right) \sqrt{200 - \frac{1}{24}} - 3 \right) \cos\left(\frac{\pi}{18} - \frac{400\pi}{3}\right) \right) \right)}{\sqrt{6} \pi \sqrt{200 - \frac{1}{24}}^2} =$$

$$\frac{200 \cosh\left(i \left(-\frac{400\pi}{3} + \frac{\pi}{18}\right)\right) e^{1/3 \pi \sqrt{2/3} \sqrt{200-1/24}} \left(-3 + \pi \sqrt{\frac{2}{3}} \sqrt{200 - \frac{1}{24}}\right)}{\pi \sqrt{200 - \frac{1}{24}}^2 \sqrt{6}}$$

$$\frac{200 \left(e^{1/3 (\pi \sqrt{2/3}) \sqrt{200-1/24}} \left(\left(\left(\pi \sqrt{\frac{2}{3}} \right) \sqrt{200 - \frac{1}{24}} - 3 \right) \cos\left(\frac{\pi}{18} - \frac{400\pi}{3}\right) \right) \right)}{\sqrt{6} \pi \sqrt{200 - \frac{1}{24}}^2} =$$

$$\frac{200 \cosh\left(-i \left(-\frac{400\pi}{3} + \frac{\pi}{18}\right)\right) e^{1/3 \pi \sqrt{2/3} \sqrt{200-1/24}} \left(-3 + \pi \sqrt{\frac{2}{3}} \sqrt{200 - \frac{1}{24}}\right)}{\pi \sqrt{200 - \frac{1}{24}}^2 \sqrt{6}}$$

$$\frac{200 \left(e^{1/3 (\pi \sqrt{2/3}) \sqrt{200-1/24}} \left(\left(\left(\pi \sqrt{\frac{2}{3}} \right) \sqrt{200 - \frac{1}{24}} - 3 \right) \cos\left(\frac{\pi}{18} - \frac{400\pi}{3}\right) \right) \right)}{\sqrt{6} \pi \sqrt{200 - \frac{1}{24}}^2} =$$

$$\frac{200 e^{1/3 \pi \sqrt{2/3} \sqrt{200-1/24}} \left(-3 + \pi \sqrt{\frac{2}{3}} \sqrt{200 - \frac{1}{24}} \right)}{\csc\left(\frac{803\pi}{6} - \frac{\pi}{18}\right) \left(\pi \sqrt{200 - \frac{1}{24}} \sqrt{6} \right)^2}$$

Series representations

$$\frac{200 \left(e^{1/3 (\pi \sqrt{2/3}) \sqrt{200-1/24}} \left(\left(\left(\pi \sqrt{\frac{2}{3}} \right) \sqrt{200 - \frac{1}{24}} - 3 \right) \cos\left(\frac{\pi}{18} - \frac{400\pi}{3}\right) \right) \right)}{\sqrt{6} \pi \sqrt{200 - \frac{1}{24}}^2} =$$

$$- \frac{400 \sqrt{\frac{2}{3}} e^{(\sqrt{4799} \pi)/18} (-18 + \sqrt{4799} \pi) \sum_{k=0}^{\infty} \frac{(-1)^{3k} \left(\frac{5\pi}{18}\right)^{2k}}{(2k)!}}{4799 \pi}$$

$$\frac{200 \left(e^{1/3 (\pi \sqrt{2/3}) \sqrt{200-1/24}} \left(\left(\left(\pi \sqrt{\frac{2}{3}} \right) \sqrt{200 - \frac{1}{24}} - 3 \right) \cos\left(\frac{\pi}{18} - \frac{400\pi}{3}\right) \right) \right)}{\sqrt{6} \pi \sqrt{200 - \frac{1}{24}}^2} =$$

$$- \frac{800 \sqrt{\frac{2}{3}} e^{(\sqrt{4799} \pi)/18} (-18 + \sqrt{4799} \pi) \sum_{k=0}^{\infty} (-1)^k J_{1+2k}\left(\frac{2\pi}{9}\right)}{4799 \pi}$$

$$\frac{200 \left(e^{1/3 (\pi \sqrt{2/3}) \sqrt{200-1/24}} \left(\left(\left(\pi \sqrt{\frac{2}{3}} \right) \sqrt{200 - \frac{1}{24}} - 3 \right) \cos \left(\frac{\pi}{18} - \frac{400\pi}{3} \right) \right) \right)}{\sqrt{6} \pi \sqrt{200 - \frac{1}{24}}^2} =$$

$$- \frac{800 \sqrt{6} e^{(\sqrt{4799} \pi)/18} \left(-3 + \frac{\sqrt{4799} \pi}{6} \right) \sum_{k=0}^{\infty} \frac{(-1)^k 9^{-1-2k} (2\pi)^{1+2k}}{(1+2k)!}}{4799 \pi}$$

Integral representations

$$\frac{200 \left(e^{1/3 (\pi \sqrt{2/3}) \sqrt{200-1/24}} \left(\left(\left(\pi \sqrt{\frac{2}{3}} \right) \sqrt{200 - \frac{1}{24}} - 3 \right) \cos \left(\frac{\pi}{18} - \frac{400\pi}{3} \right) \right) \right)}{\sqrt{6} \pi \sqrt{200 - \frac{1}{24}}^2} =$$

$$- \frac{800 \sqrt{\frac{2}{3}} e^{(\sqrt{4799} \pi)/18} (-18 + \sqrt{4799} \pi)}{43191} \int_0^1 \cos \left(\frac{2\pi t}{9} \right) dt$$

$$\frac{200 \left(e^{1/3 (\pi \sqrt{2/3}) \sqrt{200-1/24}} \left(\left(\left(\pi \sqrt{\frac{2}{3}} \right) \sqrt{200 - \frac{1}{24}} - 3 \right) \cos \left(\frac{\pi}{18} - \frac{400\pi}{3} \right) \right) \right)}{\sqrt{6} \pi \sqrt{200 - \frac{1}{24}}^2} =$$

$$\frac{200 i e^{(\sqrt{4799} \pi)/18} \sqrt{\frac{2}{3\pi}} (-18 + \sqrt{4799} \pi)}{43191} \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{e^{-\pi^2/(81s)+s}}{s^{3/2}} ds \text{ for } \gamma > 0$$

$$\frac{200 \left(e^{1/3 (\pi \sqrt{2/3}) \sqrt{200-1/24}} \left(\left(\left(\pi \sqrt{\frac{2}{3}} \right) \sqrt{200 - \frac{1}{24}} - 3 \right) \cos \left(\frac{\pi}{18} - \frac{400\pi}{3} \right) \right) \right)}{\sqrt{6} \pi \sqrt{200 - \frac{1}{24}}^2} =$$

$$\frac{400 i \sqrt{6} e^{(\sqrt{4799} \pi)/18} \left(-3 + \frac{\sqrt{4799} \pi}{6} \right)}{4799 \pi^{3/2}} \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{\left(\frac{\pi}{9} \right)^{1-2s} \Gamma(s)}{\Gamma\left(\frac{3}{2} - s \right)} ds \text{ for } 0 < \gamma < 1$$

We consider also:

$$\text{Sqrt3}/(\text{Pi}*\text{sqrt2}) \cos(2/3*n*\text{Pi} - 1/18*\text{Pi}) (x * (((e^{(1/3*C*\lambda)})/\lambda)))$$

i.e.

$$\text{Sqrt3}/(\text{Pi}*\text{sqrt2}) \cos(2/3*200*\text{Pi} - 1/18*\text{Pi}) x * (((((e^{(1/3*(((\text{Pisqrt}(2/3))\text{sqrt}(200-1/24)))))))/(\text{sqrt}(200-1/24))))))$$

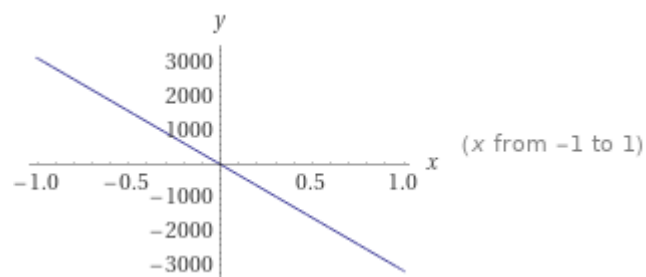
Input

$$\frac{\sqrt{3}}{\pi \sqrt{2}} \cos\left(\frac{2}{3} \times 200 \pi - \frac{1}{18} \pi\right) \left(x \times \frac{\exp\left(\frac{1}{3} \left(\left(\pi \sqrt{\frac{2}{3}} \right) \sqrt{200 - \frac{1}{24}} \right) \right)}{\sqrt{200 - \frac{1}{24}}} \right)$$

Exact result

$$-\frac{6 e^{(\sqrt{4799} \pi)/18} x \sin\left(\frac{2\pi}{9}\right)}{\sqrt{4799} \pi}$$

Plot



Geometric figure

line

Alternate forms

$$-\frac{12 e^{(\sqrt{4799} \pi)/18} x \sin\left(\frac{\pi}{9}\right) \cos\left(\frac{\pi}{9}\right)}{\sqrt{4799} \pi}$$

$$\frac{1}{\pi} e^{(\sqrt{4799} \pi)/18} x$$

root of $110522894399 x^6 - 1243641654 x^4 + 3498471 x^2 - 2187$
 near $x = -0.0556728$

$$\frac{3 i e^{(\sqrt{4799} \pi)/18+(2 i \pi)/9} x}{\sqrt{4799} \pi} - \frac{3 i e^{(\sqrt{4799} \pi)/18-(2 i \pi)/9} x}{\sqrt{4799} \pi}$$

Alternate form assuming x is real

$$\frac{3 e^{(\sqrt{4799} \pi)/18} x \sin\left(\frac{\pi}{9}\right)}{\sqrt{4799} \pi} - \frac{3 \sqrt{\frac{3}{4799}} e^{(\sqrt{4799} \pi)/18} x \cos\left(\frac{\pi}{9}\right)}{\pi}$$

Properties as a real function

Domain

$\mathbb{R}$ (all real numbers)

Range

$\mathbb{R}$ (all real numbers)

Bijectivity

bijjective from its domain to $\mathbb{R}$

Parity

odd

$\mathbb{R}$ is the set of real numbers

Derivative

$$\frac{d}{dx} \left(\frac{\sqrt{3} \cos\left(\frac{2 \times 200\pi}{3} - \frac{\pi}{18}\right) \left(x e^{1/3 (\pi \sqrt{2/3}) \sqrt{200-1/24}}\right)}{(\pi \sqrt{2}) \sqrt{200 - \frac{1}{24}}} \right) = - \frac{6 e^{(\sqrt{4799} \pi)/18} \sin\left(\frac{2\pi}{9}\right)}{\sqrt{4799} \pi}$$

Indefinite integral

$$\int - \frac{6 e^{(\sqrt{4799} \pi)/18} x \sin\left(\frac{2\pi}{9}\right)}{\sqrt{4799} \pi} dx = - \frac{3 e^{(\sqrt{4799} \pi)/18} x^2 \sin\left(\frac{2\pi}{9}\right)}{\sqrt{4799} \pi} + \text{constant}$$

From:

Derivative

$$\frac{d}{dx} \left(\frac{\sqrt{3} \cos\left(\frac{2 \times 200\pi}{3} - \frac{\pi}{18}\right) \left(x e^{1/3 (\pi \sqrt{2/3}) \sqrt{200-1/24}}\right)}{(\pi \sqrt{2}) \sqrt{200 - \frac{1}{24}}} \right) \approx -3158.16$$

$$= -3158.16$$

We consider:

$p(200)$:

$$(((1/(2\text{Pisqrt}2) \ 200/3158.16 \ (\exp((\text{Pisqrt}(2/3))\text{sqrt}(200-1/24)))/(\text{sqrt}(200-1/24))))+1/(2\text{Pi}) \ 200/3158.16 \ \exp(((1/2(\text{Pisqrt}(2/3))\text{sqrt}(200-1/24)))))/(\text{sqrt}(200-1/24))+(e^{(0.943\text{sqrt}(200))}))))$$

Input interpretation

$$\frac{1}{2\pi\sqrt{2}} \times \frac{200}{3158.16} \times \frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{\sqrt{200-\frac{1}{24}}} +$$

$$\frac{1}{2\pi} \times \frac{200}{3158.16} \times \frac{\exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{\sqrt{200-\frac{1}{24}}} + e^{0.943\sqrt{200}}$$

Result

$$2.85267... \times 10^{12}$$

$$2.85267... * 10^{12}$$

Alternative representations

$$\frac{200 \exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{\left(3158.16\sqrt{200-\frac{1}{24}}\right)(2\pi\sqrt{2})} + \frac{200 \exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{\left(3158.16\sqrt{200-\frac{1}{24}}\right)(2\pi)} + e^{0.943\sqrt{200}} =$$

$$\frac{200 \exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{\left(3158.16\sqrt{200-\frac{1}{24}}\right)(2\pi\sqrt{2})} + \frac{200 \exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{\left(3158.16\sqrt{200-\frac{1}{24}}\right)(2\pi)} + w^a$$

for $a = \frac{13.336}{\log(w)}$

$$\begin{aligned}
& \frac{200 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(3158.16 \sqrt{200 - \frac{1}{24}}\right) (2\pi \sqrt{2})} + \frac{200 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(3158.16 \sqrt{200 - \frac{1}{24}}\right) (2\pi)} + e^{0.943 \sqrt{200}} = \\
& \frac{200 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(3158.16 \sqrt{200 - \frac{1}{24}}\right) (2\pi \sqrt{2})} + \\
& \frac{200 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(3158.16 \sqrt{200 - \frac{1}{24}}\right) (2\pi)} + z^{0.943 \sqrt{200}} \text{ for } z = e
\end{aligned}$$

$$\begin{aligned}
& \frac{200 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(3158.16 \sqrt{200 - \frac{1}{24}}\right) (2\pi \sqrt{2})} + \frac{200 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(3158.16 \sqrt{200 - \frac{1}{24}}\right) (2\pi)} + e^{0.943 \sqrt{200}} = \\
& 1 + \frac{2}{-1 + \coth(0.4715 \sqrt{200})} + \\
& \frac{200 \exp\left(\frac{1}{2} \pi \sqrt{\frac{2}{3}} \sqrt{200 - \frac{1}{24}}\right)}{3158.16 (2\pi) \sqrt{200 - \frac{1}{24}}} + \frac{200 \exp\left(\pi \sqrt{\frac{2}{3}} \sqrt{200 - \frac{1}{24}}\right)}{3158.16 (2\pi \sqrt{2}) \sqrt{200 - \frac{1}{24}}}
\end{aligned}$$

From which:

$$1.3927308051721 * (((1/(2\text{Pisqrt}2) 200/3158.16 (\exp((\text{Pisqrt}(2/3))\text{sqrt}(200-1/24)))/(\text{sqrt}(200-1/24))))+1/(2\text{Pi}) 200/3158.16 \exp(((1/2(\text{Pisqrt}(2/3))\text{sqrt}(200-1/24)))))/(\text{sqrt}(200-1/24)))+(e^{(0.943\text{sqrt}(200))})))$$

Input interpretation

$$1.3927308051721 \left(\frac{1}{2\pi\sqrt{2}} \times \frac{200}{3158.16} \times \frac{\exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{\sqrt{200-\frac{1}{24}}} + \right. \\ \left. \frac{1}{2\pi} \times \frac{200}{3158.16} \times \frac{\exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{\sqrt{200-\frac{1}{24}}} + e^{0.943\sqrt{200}} \right)$$

Result

3.97299902938773528716463487702437816222030391448453500181490... $\times 10^{12}$

$3.972999029... \times 10^{12} \approx p(200)$

Alternative representations

$$1.39273080517210000 \left(\frac{200 \exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{\left(3158.16\sqrt{200-\frac{1}{24}}\right)(2\pi\sqrt{2})} + \right. \\ \left. \frac{200 \exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{\left(3158.16\sqrt{200-\frac{1}{24}}\right)(2\pi)} + e^{0.943\sqrt{200}} \right) = \\ 1.39273080517210000 \left(\frac{200 \exp\left(\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{\left(3158.16\sqrt{200-\frac{1}{24}}\right)(2\pi\sqrt{2})} + \right. \\ \left. \frac{200 \exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{\left(3158.16\sqrt{200-\frac{1}{24}}\right)(2\pi)} + w^a \right) \text{ for } a = \frac{13.336}{\log(w)}$$

$$\begin{aligned}
& 1.39273080517210000 \left(\frac{200 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(3158.16 \sqrt{200 - \frac{1}{24}}\right) (2 \pi \sqrt{2})} + \right. \\
& \left. \frac{200 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(3158.16 \sqrt{200 - \frac{1}{24}}\right) (2 \pi)} + e^{0.943 \sqrt{200}} \right) = \\
& 1.39273080517210000 \left(\frac{200 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(3158.16 \sqrt{200 - \frac{1}{24}}\right) (2 \pi \sqrt{2})} + \right. \\
& \left. \frac{200 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(3158.16 \sqrt{200 - \frac{1}{24}}\right) (2 \pi)} + z^{0.943 \sqrt{200}} \right) \text{ for } z = e
\end{aligned}$$

$$\begin{aligned}
& 1.39273080517210000 \left(\frac{200 \exp\left(\left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(3158.16 \sqrt{200 - \frac{1}{24}}\right) (2 \pi \sqrt{2})} + \right. \\
& \left. \frac{200 \exp\left(\frac{1}{2} \left(\pi \sqrt{\frac{2}{3}}\right) \sqrt{200 - \frac{1}{24}}\right)}{\left(3158.16 \sqrt{200 - \frac{1}{24}}\right) (2 \pi)} + e^{0.943 \sqrt{200}} \right) = \\
& 1.39273080517210000 \left(1 + \frac{2}{-1 + \coth(0.4715 \sqrt{200})} + \right. \\
& \left. \frac{200 \exp\left(\frac{1}{2} \pi \sqrt{\frac{2}{3}} \sqrt{200 - \frac{1}{24}}\right)}{3158.16 (2 \pi) \sqrt{200 - \frac{1}{24}}} + \frac{200 \exp\left(\pi \sqrt{\frac{2}{3}} \sqrt{200 - \frac{1}{24}}\right)}{3158.16 (2 \pi \sqrt{2}) \sqrt{200 - \frac{1}{24}}} \right)
\end{aligned}$$

Or also:

$$((e^{(-3/2-2/e-1/\pi+\pi)}\sin(e\pi))(((1/(2\text{Pisqrt}2)0.063328(e^{((\text{Pisqrt}(2/3))\sqrt{200-1/24}))/(\sqrt{200-1/24}))+1/(2\text{Pi})0.063328e^{(((1/2(\text{Pisqrt}(2/3))\sqrt{200-1/24}))/(\sqrt{200-1/24}))+e^{(0.943\sqrt{200}))}))))))$$

where $((e^{(-3/2-2/e-1/\pi+\pi)}\sin(e\pi))) = 1.3927308051721$

Input

$$\left(e^{-3/2-2/e-1/\pi+\pi} \sin(e\pi) \right) \left(\frac{1}{2\pi\sqrt{2}} \times 0.063328 \times \frac{e^{(\pi\sqrt{2/3})\sqrt{200-1/24}}}{\sqrt{200-\frac{1}{24}}} + \frac{1}{2\pi} \times 0.063328 \times \frac{\exp\left(\frac{1}{2}\left(\pi\sqrt{\frac{2}{3}}\right)\sqrt{200-\frac{1}{24}}\right)}{\sqrt{200-\frac{1}{24}}} + e^{0.943\sqrt{200}} \right)$$

Result

3.97299816098677225232405027556194954916351990317672355582085... $\times 10^{12}$

3.9729981609... $\times 10^{12}$

Alternative representations

$$\left(\frac{0.063328 e^{(\pi\sqrt{2/3})\sqrt{200-1/24}}}{(2\pi\sqrt{2})\sqrt{200-\frac{1}{24}}} + \frac{0.063328 e^{1/2(\pi\sqrt{2/3})\sqrt{200-1/24}}}{(2\pi)\sqrt{200-\frac{1}{24}}} + e^{0.943\sqrt{200}} \right)$$

$$e^{-3/2-2/e-1/\pi+\pi} \sin(e\pi) = \frac{1}{\csc(e\pi)} e^{-3/2+\pi-2/e-1/\pi}$$

$$\left(e^{0.943\sqrt{200}} + \frac{0.063328 e^{1/2\pi\sqrt{2/3}\sqrt{200-1/24}}}{(2\pi)\sqrt{200-\frac{1}{24}}} + \frac{0.063328 e^{\pi\sqrt{2/3}\sqrt{200-1/24}}}{(2\pi\sqrt{2})\sqrt{200-\frac{1}{24}}} \right)$$

$$\begin{aligned}
& \left(\frac{0.063328 e^{(\pi \sqrt{2/3}) \sqrt{200-1/24}}}{(2 \pi \sqrt{2}) \sqrt{200 - \frac{1}{24}}} + \frac{0.063328 e^{1/2 (\pi \sqrt{2/3}) \sqrt{200-1/24}}}{(2 \pi) \sqrt{200 - \frac{1}{24}}} + e^{0.943 \sqrt{200}} \right) \\
& e^{-3/2-2/e-1/\pi+\pi} \sin(e \pi) = \cos\left(\frac{\pi}{2} - e \pi\right) e^{-3/2+\pi-2/e-1/\pi} \\
& \left(e^{0.943 \sqrt{200}} + \frac{0.063328 e^{1/2 \pi \sqrt{2/3} \sqrt{200-1/24}}}{(2 \pi) \sqrt{200 - \frac{1}{24}}} + \frac{0.063328 e^{\pi \sqrt{2/3} \sqrt{200-1/24}}}{(2 \pi \sqrt{2}) \sqrt{200 - \frac{1}{24}}} \right)
\end{aligned}$$

$$\begin{aligned}
& \left(\frac{0.063328 e^{(\pi \sqrt{2/3}) \sqrt{200-1/24}}}{(2 \pi \sqrt{2}) \sqrt{200 - \frac{1}{24}}} + \frac{0.063328 e^{1/2 (\pi \sqrt{2/3}) \sqrt{200-1/24}}}{(2 \pi) \sqrt{200 - \frac{1}{24}}} + e^{0.943 \sqrt{200}} \right) \\
& e^{-3/2-2/e-1/\pi+\pi} \sin(e \pi) = -\cos\left(\frac{\pi}{2} + e \pi\right) e^{-3/2+\pi-2/e-1/\pi} \\
& \left(e^{0.943 \sqrt{200}} + \frac{0.063328 e^{1/2 \pi \sqrt{2/3} \sqrt{200-1/24}}}{(2 \pi) \sqrt{200 - \frac{1}{24}}} + \frac{0.063328 e^{\pi \sqrt{2/3} \sqrt{200-1/24}}}{(2 \pi \sqrt{2}) \sqrt{200 - \frac{1}{24}}} \right)
\end{aligned}$$

Series representations

$$\begin{aligned}
 & \left(\frac{0.063328 e^{(\pi \sqrt{2/3}) \sqrt{200-1/24}}}{(2\pi \sqrt{2}) \sqrt{200 - \frac{1}{24}}} + \frac{0.063328 e^{1/2(\pi \sqrt{2/3}) \sqrt{200-1/24}}}{(2\pi) \sqrt{200 - \frac{1}{24}}} + e^{0.943 \sqrt{200}} \right) \\
 & e^{-3/2-2/e-1/\pi+\pi} \sin(e\pi) = \left[e^{-3/2-2/e-1/\pi} \left(0.031664 \right. \right. \\
 & e^{\pi+\pi \exp\left(i\pi \left\lfloor \frac{\arg(\frac{2}{3}-x)}{2\pi} \right\rfloor\right) \exp\left(i\pi \left\lfloor \frac{\arg(\frac{4799}{24}-x)}{2\pi} \right\rfloor\right) \sqrt{x}^2 \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(\frac{2}{3}-x\right)^{k_1} \left(\frac{4799}{24}-x\right)^{k_2} x^{-k_1-k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2}}{k_1! k_2!} \\
 & \sum_{k=0}^{\infty} \frac{\sin\left(\frac{k\pi}{2} + z_0\right) (e\pi - z_0)^k}{k!} + 0.031664 \\
 & e^{\pi+\frac{1}{2}\pi \exp\left(i\pi \left\lfloor \frac{\arg(\frac{2}{3}-x)}{2\pi} \right\rfloor\right) \exp\left(i\pi \left\lfloor \frac{\arg(\frac{4799}{24}-x)}{2\pi} \right\rfloor\right) \sqrt{x}^2 \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(\frac{2}{3}-x\right)^{k_1} \left(\frac{4799}{24}-x\right)^{k_2} x^{-k_1-k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2}}{k_1! k_2!} \\
 & \exp\left(i\pi \left\lfloor \frac{\arg(2-x)}{2\pi} \right\rfloor\right) \sqrt{x} \\
 & \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1} (2-x)^{k_1} x^{-k_1} \left(-\frac{1}{2}\right)_{k_1} \sin\left(\frac{\pi k_2}{2} + z_0\right) (e\pi - z_0)^{k_2}}{k_1! k_2!} + \\
 & e^{\pi+0.943 \exp\left(i\pi \left\lfloor \frac{\arg(200-x)}{2\pi} \right\rfloor\right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (200-x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \pi} \\
 & \exp\left(i\pi \left\lfloor \frac{\arg(2-x)}{2\pi} \right\rfloor\right) \exp\left(i\pi \left\lfloor \frac{\arg(\frac{4799}{24}-x)}{2\pi} \right\rfloor\right) \sqrt{x}^2 \\
 & \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \sum_{k_3=0}^{\infty} \frac{1}{k_1! k_2! k_3!} (-1)^{k_1+k_2} (2-x)^{k_1} \left(\frac{4799}{24}-x\right)^{k_2} \\
 & x^{-k_1-k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2} \sin\left(\frac{\pi k_3}{2} + z_0\right) (e\pi - z_0)^{k_3} \Bigg) / \\
 & \left(\pi \exp\left(i\pi \left\lfloor \frac{\arg(2-x)}{2\pi} \right\rfloor\right) \exp\left(i\pi \left\lfloor \frac{\arg(\frac{4799}{24}-x)}{2\pi} \right\rfloor\right) \sqrt{x}^2 \right. \\
 & \left(\sum_{k=0}^{\infty} \frac{(-1)^k (2-x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \\
 & \left. \sum_{k=0}^{\infty} \frac{(-1)^k \left(\frac{4799}{24}-x\right)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \text{ for } (x \in \mathbb{R} \text{ and } x < 0)
 \end{aligned}$$

$$\begin{aligned}
& \left(\frac{0.063328 e^{(\pi \sqrt{2/3}) \sqrt{200-1/24}}}{(2\pi \sqrt{2}) \sqrt{200 - \frac{1}{24}}} + \frac{0.063328 e^{1/2 (\pi \sqrt{2/3}) \sqrt{200-1/24}}}{(2\pi) \sqrt{200 - \frac{1}{24}}} + e^{0.943 \sqrt{200}} \right) \\
& e^{-3/2-2/\epsilon-1/\pi+\pi} \sin(e\pi) = \left(2 e^{-3/2-2/\epsilon-1/\pi} \left(0.031664 \right. \right. \\
& e^{\pi+\pi} \exp\left(i\pi \left\lfloor \frac{\arg(\frac{2}{3}-x)}{2\pi} \right\rfloor\right) \exp\left(i\pi \left\lfloor \frac{\arg(\frac{4799}{24}-x)}{2\pi} \right\rfloor\right) \sqrt{x}^2 \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(\frac{2}{3}-x\right)^{k_1} \left(\frac{4799}{24}-x\right)^{k_2} x^{-k_1-k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2}}{k_1! k_2!} \\
& \sum_{k=0}^{\infty} (-1)^k J_{1+2k}(e\pi) + 0.031664 \\
& e^{\pi+\frac{1}{2}\pi} \exp\left(i\pi \left\lfloor \frac{\arg(\frac{2}{3}-x)}{2\pi} \right\rfloor\right) \exp\left(i\pi \left\lfloor \frac{\arg(\frac{4799}{24}-x)}{2\pi} \right\rfloor\right) \sqrt{x}^2 \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(\frac{2}{3}-x\right)^{k_1} \left(\frac{4799}{24}-x\right)^{k_2} x^{-k_1-k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2}}{k_1! k_2!} \\
& \exp\left(i\pi \left\lfloor \frac{\arg(2-x)}{2\pi} \right\rfloor\right) \sqrt{x} \\
& \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} (2-x)^{k_2} x^{-k_2} J_{1+2k_1}(e\pi) \left(-\frac{1}{2}\right)_{k_2}}{k_2!} + \\
& e^{\pi+0.943} \exp\left(i\pi \left\lfloor \frac{\arg(200-x)}{2\pi} \right\rfloor\right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (200-x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \pi \\
& \exp\left(i\pi \left\lfloor \frac{\arg(2-x)}{2\pi} \right\rfloor\right) \exp\left(i\pi \left\lfloor \frac{\arg(\frac{4799}{24}-x)}{2\pi} \right\rfloor\right) \sqrt{x}^2 \\
& \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \sum_{k_3=0}^{\infty} \frac{1}{k_2! k_3!} (-1)^{k_1+k_2+k_3} (2-x)^{k_2} \left(\frac{4799}{24}-x\right)^{k_3} \\
& x^{-k_2-k_3} J_{1+2k_1}(e\pi) \left(-\frac{1}{2}\right)_{k_2} \left(-\frac{1}{2}\right)_{k_3} \Bigg) / \\
& \left(\pi \exp\left(i\pi \left\lfloor \frac{\arg(2-x)}{2\pi} \right\rfloor\right) \exp\left(i\pi \left\lfloor \frac{\arg(\frac{4799}{24}-x)}{2\pi} \right\rfloor\right) \sqrt{x}^2 \right. \\
& \left(\sum_{k=0}^{\infty} \frac{(-1)^k (2-x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \\
& \left. \sum_{k=0}^{\infty} \frac{(-1)^k \left(\frac{4799}{24}-x\right)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \text{ for } (x \in \mathbb{R} \text{ and } x < 0)
\end{aligned}$$

$$\begin{aligned}
& \left(\frac{0.063328 e^{(\pi \sqrt{2/3}) \sqrt{200-1/24}}}{(2\pi \sqrt{2}) \sqrt{200 - \frac{1}{24}}} + \frac{0.063328 e^{1/2(\pi \sqrt{2/3}) \sqrt{200-1/24}}}{(2\pi) \sqrt{200 - \frac{1}{24}}} + e^{0.943 \sqrt{200}} \right) \\
& e^{-3/2-2/e-1/\pi+\pi} \sin(e\pi) = \left(e^{-3/2-2/e-1/\pi} \left(0.031664 \right. \right. \\
& e^{\pi+\pi \exp\left(i\pi \left\lfloor \frac{\arg(\frac{2}{3}-x)}{2\pi} \right\rfloor\right) \exp\left(i\pi \left\lfloor \frac{\arg(\frac{4799}{24}-x)}{2\pi} \right\rfloor\right) \sqrt{x}^2 \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(\frac{2}{3}-x\right)^{k_1} \left(\frac{4799}{24}-x\right)^{k_2} x^{-k_1-k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2}}{k_1! k_2!} \\
& \sum_{k=0}^{\infty} \frac{(-1)^k e^{\pi} (\pi)^{2k}}{(1+2k)!} + 0.031664 \\
& e^{\pi+\frac{1}{2}\pi \exp\left(i\pi \left\lfloor \frac{\arg(\frac{2}{3}-x)}{2\pi} \right\rfloor\right) \exp\left(i\pi \left\lfloor \frac{\arg(\frac{4799}{24}-x)}{2\pi} \right\rfloor\right) \sqrt{x}^2 \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} \left(\frac{2}{3}-x\right)^{k_1} \left(\frac{4799}{24}-x\right)^{k_2} x^{-k_1-k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2}}{k_1! k_2!} \\
& \exp\left(i\pi \left\lfloor \frac{\arg(2-x)}{2\pi} \right\rfloor\right) \sqrt{x} \\
& \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} (e\pi)^{1+2k_1} (2-x)^{k_2} x^{-k_2} \left(-\frac{1}{2}\right)_{k_2}}{(1+2k_1)! k_2!} + \\
& e^{\pi+0.943 \exp\left(i\pi \left\lfloor \frac{\arg(200-x)}{2\pi} \right\rfloor\right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (200-x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \pi \\
& \exp\left(i\pi \left\lfloor \frac{\arg(2-x)}{2\pi} \right\rfloor\right) \exp\left(i\pi \left\lfloor \frac{\arg(\frac{4799}{24}-x)}{2\pi} \right\rfloor\right) \sqrt{x}^2 \\
& \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \sum_{k_3=0}^{\infty} \left((-1)^{k_1+k_2+k_3} (e\pi)^{1+2k_1} (2-x)^{k_2} \left(\frac{4799}{24}-x\right)^{k_3} \right. \\
& \left. x^{-k_2-k_3} \left(-\frac{1}{2}\right)_{k_2} \left(-\frac{1}{2}\right)_{k_3} \right) / ((1+2k_1)! k_2! k_3!) \Bigg) \Bigg/ \\
& \left(\pi \exp\left(i\pi \left\lfloor \frac{\arg(2-x)}{2\pi} \right\rfloor\right) \exp\left(i\pi \left\lfloor \frac{\arg(\frac{4799}{24}-x)}{2\pi} \right\rfloor\right) \sqrt{x}^2 \right. \\
& \left(\sum_{k=0}^{\infty} \frac{(-1)^k (2-x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \\
& \left. \sum_{k=0}^{\infty} \frac{(-1)^k \left(\frac{4799}{24}-x\right)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \text{ for } (x \in \mathbb{R} \text{ and } x < 0)
\end{aligned}$$

Integral representations

$$\begin{aligned}
 & \left(\frac{0.063328 e^{(\pi \sqrt{2/3}) \sqrt{200-1/24}}}{(2\pi \sqrt{2}) \sqrt{200 - \frac{1}{24}}} + \frac{0.063328 e^{1/2 (\pi \sqrt{2/3}) \sqrt{200-1/24}}}{(2\pi) \sqrt{200 - \frac{1}{24}}} + e^{0.943 \sqrt{200}} \right) \\
 & e^{-3/2-2/e-1/\pi+\pi} \sin(e\pi) = \\
 & \int_0^1 \frac{1}{\sqrt{2} \sqrt{\frac{4799}{24}}} e^{-1/2-2/e-1/\pi+\pi} \cos(e\pi t) \left(0.031664 e^{\pi \sqrt{2/3} \sqrt{4799/24}} + \right. \\
 & \left. 0.031664 e^{1/2 \pi \sqrt{2/3} \sqrt{4799/24}} \sqrt{2} + e^{0.943 \sqrt{200}} \pi \sqrt{2} \sqrt{\frac{4799}{24}} \right) dt
 \end{aligned}$$

$$\begin{aligned}
 & \left(\frac{0.063328 e^{(\pi \sqrt{2/3}) \sqrt{200-1/24}}}{(2\pi \sqrt{2}) \sqrt{200 - \frac{1}{24}}} + \frac{0.063328 e^{1/2 (\pi \sqrt{2/3}) \sqrt{200-1/24}}}{(2\pi) \sqrt{200 - \frac{1}{24}}} + e^{0.943 \sqrt{200}} \right) \\
 & e^{-3/2-2/e-1/\pi+\pi} \sin(e\pi) = \frac{1}{i\pi \sqrt{2} \sqrt{\frac{4799}{24}}} 0.25 e^{-1/2-2/e-1/\pi+\pi} \\
 & \left(0.031664 e^{\pi \sqrt{2/3} \sqrt{4799/24}} + 0.031664 e^{1/2 \pi \sqrt{2/3} \sqrt{4799/24}} \sqrt{2} + \right. \\
 & \left. e^{0.943 \sqrt{200}} \pi \sqrt{2} \sqrt{\frac{4799}{24}} \right) \sqrt{\pi} \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{\mathcal{A}^{-(e^2 \pi^2)/(4s)+s}}{s^{3/2}} ds \text{ for } \gamma > 0
 \end{aligned}$$

$$\begin{aligned}
& \left(\frac{0.063328 e^{(\pi \sqrt{2/3}) \sqrt{200-1/24}}}{(2\pi \sqrt{2}) \sqrt{200 - \frac{1}{24}}} + \frac{0.063328 e^{1/2(\pi \sqrt{2/3}) \sqrt{200-1/24}}}{(2\pi) \sqrt{200 - \frac{1}{24}}} + e^{0.943 \sqrt{200}} \right) \\
& e^{-3/2-2/e-1/\pi+\pi} \sin(e\pi) = \frac{1}{2i\pi} e^{-3/2-2/e-1/\pi+\pi} \\
& \left(e^{0.943 \sqrt{200}} + \frac{0.031664 e^{1/2\pi \sqrt{2/3} \sqrt{4799/24}}}{\pi \sqrt{\frac{4799}{24}}} + \frac{0.031664 e^{\pi \sqrt{2/3} \sqrt{4799/24}}}{\pi \sqrt{2} \sqrt{\frac{4799}{24}}} \right) \\
& \sqrt{\pi} \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{2^{-1+2s} (e\pi)^{1-2s} \Gamma(s)}{\Gamma(\frac{3}{2}-s)} ds \text{ for } 0 < \gamma < 1
\end{aligned}$$

Multiple-argument formulas

$$\begin{aligned}
& \left(\frac{0.063328 e^{(\pi \sqrt{2/3}) \sqrt{200-1/24}}}{(2\pi \sqrt{2}) \sqrt{200 - \frac{1}{24}}} + \frac{0.063328 e^{1/2(\pi \sqrt{2/3}) \sqrt{200-1/24}}}{(2\pi) \sqrt{200 - \frac{1}{24}}} + e^{0.943 \sqrt{200}} \right) \\
& e^{-3/2-2/e-1/\pi+\pi} \sin(e\pi) = \frac{1}{\pi \sqrt{2} \sqrt{\frac{4799}{24}}} \\
& e^{-3/2-2/e-1/\pi+\pi} \left(3 \sin\left(\frac{e\pi}{3}\right) - 4 \sin^3\left(\frac{e\pi}{3}\right) \right) \left(0.031664 e^{\pi \sqrt{2/3} \sqrt{4799/24}} + \right. \\
& \left. 0.031664 e^{1/2\pi \sqrt{2/3} \sqrt{4799/24}} \sqrt{2} + e^{0.943 \sqrt{200}} \pi \sqrt{2} \sqrt{\frac{4799}{24}} \right)
\end{aligned}$$

$$\left(\frac{0.063328 e^{(\pi \sqrt{2/3}) \sqrt{200-1/24}}}{(2\pi \sqrt{2}) \sqrt{200 - \frac{1}{24}}} + \frac{0.063328 e^{1/2(\pi \sqrt{2/3}) \sqrt{200-1/24}}}{(2\pi) \sqrt{200 - \frac{1}{24}}} + e^{0.943 \sqrt{200}} \right)$$

$$e^{-3/2-2/e-1/\pi+\pi} \sin(e \pi) = \frac{1}{\pi \sqrt{2} \sqrt{\frac{4799}{24}}}$$

$$2 e^{-3/2-2/e-1/\pi+\pi} \cos\left(\frac{e \pi}{2}\right) \sin\left(\frac{e \pi}{2}\right) \left(0.031664 e^{\pi \sqrt{2/3} \sqrt{4799/24}} + \right.$$

$$\left. 0.031664 e^{1/2 \pi \sqrt{2/3} \sqrt{4799/24}} \sqrt{2} + e^{0.943 \sqrt{200}} \pi \sqrt{2} \sqrt{\frac{4799}{24}} \right)$$

$$\left(\frac{0.063328 e^{(\pi \sqrt{2/3}) \sqrt{200-1/24}}}{(2\pi \sqrt{2}) \sqrt{200 - \frac{1}{24}}} + \frac{0.063328 e^{1/2(\pi \sqrt{2/3}) \sqrt{200-1/24}}}{(2\pi) \sqrt{200 - \frac{1}{24}}} + e^{0.943 \sqrt{200}} \right)$$

$$e^{-3/2-2/e-1/\pi+\pi} \sin(e \pi) =$$

$$\frac{1}{\pi \sqrt{2} \sqrt{\frac{4799}{24}}} e^{-3/2-2/e-1/\pi+\pi} U_{-1+e}(\cos(\pi)) \sin(\pi) \left(0.031664 e^{\pi \sqrt{2/3} \sqrt{4799/24}} + \right.$$

$$\left. 0.031664 e^{1/2 \pi \sqrt{2/3} \sqrt{4799/24}} \sqrt{2} + e^{0.943 \sqrt{200}} \pi \sqrt{2} \sqrt{\frac{4799}{24}} \right)$$

And from $((e^{(-3/2-2/e-1/\pi+\pi)} \sin(e\pi))) = 1.3927308051721$, we obtain also:

$$\sqrt[3]{(e^{(-3/2-2/e-1/\pi+\pi)} \sin(e\pi))}$$

Input

$$\sqrt{(e^{-3/2-2/e-1/\pi+\pi} \sin(e \pi))^3}$$

Exact result

$$e^{-9/4-3/e-3/(2\pi)+(3\pi)/2} \sin^{3/2}(e \pi)$$

Decimal approximation

1.6436175575247951581404622509904731030068864883340296428843705042

...

$$1.643617557\dots \approx \zeta(2) = \frac{\pi^2}{6} = 1.644934\dots$$

Alternate forms

$$e^{-3/4(3+4/e+2/\pi-2\pi)} \sin^{3/2}(e\pi)$$

$$\frac{e^{-9/4-3/e-3/(2\pi)+(3\pi)/2} \left(i \left(e^{-i e \pi} - e^{i e \pi} \right) \right)^{3/2}}{2\sqrt{2}}$$

Alternative representations

$$\sqrt{\left(e^{-3/2-2/e-1/\pi+\pi} \sin(e\pi) \right)^3} = \sqrt{\left(\frac{e^{-3/2+\pi-2/e-1/\pi}}{\csc(e\pi)} \right)^3}$$

$$\sqrt{\left(e^{-3/2-2/e-1/\pi+\pi} \sin(e\pi) \right)^3} = \sqrt{\left(\cos\left(\frac{\pi}{2} - e\pi\right) e^{-3/2+\pi-2/e-1/\pi} \right)^3}$$

$$\sqrt{\left(e^{-3/2-2/e-1/\pi+\pi} \sin(e\pi) \right)^3} = \sqrt{\left(-\cos\left(\frac{\pi}{2} + e\pi\right) e^{-3/2+\pi-2/e-1/\pi} \right)^3}$$

Series representations

$$\sqrt{\left(e^{-3/2-2/e-1/\pi+\pi} \sin(e\pi) \right)^3} = 2\sqrt{2} e^{-9/4-3/e-3/(2\pi)+(3\pi)/2} \left(\sum_{k=0}^{\infty} (-1)^k J_{1+2k}(e\pi) \right)^{3/2}$$

$$\sqrt{\left(e^{-3/2-2/e-1/\pi+\pi} \sin(e\pi)\right)^3} = e^{-9/4-3/e-3/(2\pi)+(3\pi)/2} \left(\sum_{k=0}^{\infty} \frac{(-1)^k (e\pi)^{1+2k}}{(1+2k)!}\right)^{3/2}$$

$$\sqrt{\left(e^{-3/2-2/e-1/\pi+\pi} \sin(e\pi)\right)^3} = e^{-9/4-3/e-3/(2\pi)+(3\pi)/2} \left(\sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2} + e\right)\pi^{2k}}{(2k)!}\right)^{3/2}$$

Multiple-argument formulas

$$\sqrt{\left(e^{-3/2-2/e-1/\pi+\pi} \sin(e\pi)\right)^3} = e^{-9/4-3/e-3/(2\pi)+(3\pi)/2} \left(3 \sin\left(\frac{e\pi}{3}\right) - 4 \sin^3\left(\frac{e\pi}{3}\right)\right)^{3/2}$$

$$\sqrt{\left(e^{-3/2-2/e-1/\pi+\pi} \sin(e\pi)\right)^3} = 2\sqrt{2} e^{-9/4-3/e-3/(2\pi)+(3\pi)/2} \left(\cos\left(\frac{e\pi}{2}\right) \sin\left(\frac{e\pi}{2}\right)\right)^{3/2}$$

$$\sqrt{\left(e^{-3/2-2/e-1/\pi+\pi} \sin(e\pi)\right)^3} = \frac{e^{-9/4-3/e-3/(2\pi)+(3\pi)/2} \left(-i \left((-1)^e + (-1)^{1+e} e^{-2ie\pi}\right)\right)^{3/2}}{2\sqrt{2}}$$

Now, always for p(200), we consider:

For:

$$C = 2\pi/\sqrt{6} = \pi\sqrt{\frac{2}{3}}, \quad \lambda_n = \sqrt{\left(n - \frac{1}{24}\right)}.$$

we have:

$$p(n) = \frac{1}{2\pi\sqrt{2}} \frac{d}{dn} \left(\frac{e^{C\lambda_n}}{\lambda_n} \right) + \frac{(-1)^n}{2\pi} \frac{d}{dn} \left(\frac{e^{\frac{1}{2}C\lambda_n}}{\lambda_n} \right) + O(e^{D\sqrt{n}}),$$

From which

(see: **A DERIVATION OF THE HARDY-RAMANUJAN FORMULA FROM AN ARITHMETIC FORMULA** - MICHAEL DEWAR AND M. RAM MURTY - PROCEEDINGS OF THE AMERICAN MATHEMATICAL SOCIETY - Volume 141, Number 6, June 2013, Pages 1903–1911 - S 0002-9939(2012)11458-3 - Article electronically published on December 26, 2012)

We have that:

$$p(n) = \frac{2\sqrt{3}}{24n-1} \cdot e^{\frac{\pi\sqrt{24n-1}}{6}} + o\left(e^{\frac{\pi\sqrt{24n-1}}{6}}\right).$$

And:

$$o * (\exp(1/6 * \pi * \sqrt{24 * 200 - 1})) = -1.126381903297144266 \times 10^{11}$$

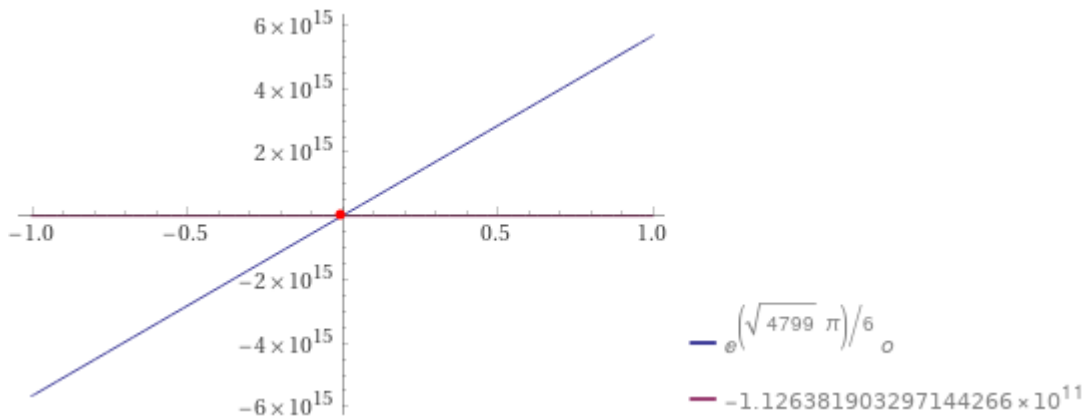
Input interpretation

$$o \exp\left(\frac{1}{6} \pi \sqrt{24 \times 200 - 1}\right) = -1.126381903297144266 \times 10^{11}$$

Result

$$e^{(\sqrt{4799} \pi)/6} o = -1.126381903297144266 \times 10^{11}$$

Plot



Alternate form

$$e^{(\sqrt{4799} \pi)/6} o + 1.126381903297144266 \times 10^{11} = 0$$

Solution

$$o \approx -0.0000199005800997728587$$

$$-0.0000199005800997728587$$

Now, we consider the following $p(n)$, for $n = 800, 400, 200, 100, 50$ and 25

$p(800)$:

$$\frac{(2\sqrt{3})}{(24 \times 800 - 1)} \exp\left(\frac{1}{6} \pi \sqrt{24 \times 800 - 1}\right) - 2.83 \times 10^{-11} \exp\left(\frac{1}{6} \pi \sqrt{24 \times 800 - 1}\right)$$

Input interpretation

$$\frac{\frac{2\sqrt{3}}{24 \times 800 - 1} \exp\left(\frac{1}{6} \pi \sqrt{24 \times 800 - 1}\right) + \exp\left(\frac{1}{6} \pi \sqrt{24 \times 800 - 1}\right) \times (-0.00001990058009)}{2.83^2}$$

Result

$$5.7331225... \times 10^{27}$$

$$5.7331225... * 10^{27} \approx p(800)$$

Series representations

$$\frac{\exp\left(\frac{1}{6}\pi\sqrt{24 \times 800 - 1}\right)(2\sqrt{3})}{24 \times 800 - 1} - \frac{0.0000199006 \exp\left(\frac{1}{6}\pi\sqrt{24 \times 800 - 1}\right)}{2.83^2} =$$

$$0.000104172 \exp\left(\frac{1}{6}\pi\sqrt{19\,198} \sum_{k=0}^{\infty} 19\,198^{-k} \binom{\frac{1}{2}}{k}\right)$$

$$\left(-0.0238529 + \sqrt{2} \sum_{k=0}^{\infty} 2^{-k} \binom{\frac{1}{2}}{k}\right)$$

$$\frac{\exp\left(\frac{1}{6}\pi\sqrt{24 \times 800 - 1}\right)(2\sqrt{3})}{24 \times 800 - 1} - \frac{0.0000199006 \exp\left(\frac{1}{6}\pi\sqrt{24 \times 800 - 1}\right)}{2.83^2} =$$

$$0.000104172 \exp\left(\frac{1}{6}\pi\sqrt{19\,198} \sum_{k=0}^{\infty} \frac{\left(-\frac{1}{19\,198}\right)^k \left(-\frac{1}{2}\right)_k}{k!}\right)$$

$$\left(-0.0238529 + \sqrt{2} \sum_{k=0}^{\infty} \frac{\left(-\frac{1}{2}\right)^k \left(-\frac{1}{2}\right)_k}{k!}\right)$$

$$\frac{\exp\left(\frac{1}{6}\pi\sqrt{24 \times 800 - 1}\right)(2\sqrt{3})}{24 \times 800 - 1} - \frac{0.0000199006 \exp\left(\frac{1}{6}\pi\sqrt{24 \times 800 - 1}\right)}{2.83^2} =$$

$$0.000104172 \exp\left(\frac{1}{6}\pi\sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (19\,199 - z_0)^k z_0^{-k}}{k!}\right)$$

$$\left(-0.0238529 + \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (3 - z_0)^k z_0^{-k}}{k!}\right)$$

for (not $(z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \leq 0)$)

p(400):

$$(2\sqrt{3}) / (24 \times 400 - 1) * \exp(1/6 * \pi * \sqrt{24 \times 400 - 1}) - 2.83^{1/6} * 0.00001990058009 (\exp(1/6 * \pi * \sqrt{24 \times 400 - 1}))$$

Input interpretation

$$\frac{\frac{2\sqrt{3}}{24 \times 400 - 1} \exp\left(\frac{1}{6} \pi \sqrt{24 \times 400 - 1}\right) + \exp\left(\frac{1}{6} \pi \sqrt{24 \times 400 - 1}\right) \times (-0.00001990058009)}{2.83}$$

Result

$$6.7271435... \times 10^{18}$$

$$6.7271435... * 10^{18} \approx p(400)$$

Series representations

$$\frac{\exp\left(\frac{1}{6} \pi \sqrt{24 \times 400 - 1}\right) (2\sqrt{3})}{24 \times 400 - 1} - \frac{0.0000199006 \exp\left(\frac{1}{6} \pi \sqrt{24 \times 400 - 1}\right)}{2.83} =$$

$$0.000208355 \exp\left(\frac{1}{6} \pi \sqrt{9598}\right) \sum_{k=0}^{\infty} 9598^{-k} \binom{\frac{1}{2}}{k} \left(-0.0337501 + \sqrt{2} \sum_{k=0}^{\infty} 2^{-k} \binom{\frac{1}{2}}{k} \right)$$

$$\frac{\exp\left(\frac{1}{6} \pi \sqrt{24 \times 400 - 1}\right) (2\sqrt{3})}{24 \times 400 - 1} - \frac{0.0000199006 \exp\left(\frac{1}{6} \pi \sqrt{24 \times 400 - 1}\right)}{2.83} =$$

$$0.000208355 \exp\left(\frac{1}{6} \pi \sqrt{9598}\right) \sum_{k=0}^{\infty} \frac{\left(-\frac{1}{9598}\right)^k \left(-\frac{1}{2}\right)_k}{k!} \left(-0.0337501 + \sqrt{2} \sum_{k=0}^{\infty} \frac{\left(-\frac{1}{2}\right)^k \left(-\frac{1}{2}\right)_k}{k!} \right)$$

$$\frac{\exp\left(\frac{1}{6}\pi\sqrt{24\times 400-1}\right)(2\sqrt{3})}{24\times 400-1} - \frac{0.0000199006\exp\left(\frac{1}{6}\pi\sqrt{24\times 400-1}\right)}{2.83} =$$

$$0.000208355\exp\left(\frac{1}{6}\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(9599-z_0)^k z_0^{-k}}{k!}\right)$$

$$\left(-0.0337501+\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}\right)$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

p(200):

$$(2\sqrt{3}) / (24*200-1) * \exp(1/6*\text{Pi}*\sqrt{24*200-1}) -$$

$$2.83^0 * 0.00001990058009(\exp(1/6*\text{Pi}*\sqrt{24*200-1}))$$

Input interpretation

$$\frac{2\sqrt{3}}{24\times 200-1}\exp\left(\frac{1}{6}\pi\sqrt{24\times 200-1}\right) +$$

$$2.83^0\exp\left(\frac{1}{6}\pi\sqrt{24\times 200-1}\right) \times (-0.00001990058009)$$

Result

$$3.97299902944... \times 10^{12}$$

$$3.97299902944... * 10^{12} \approx p(200)$$

Series representations

$$\frac{\exp\left(\frac{1}{6}\pi\sqrt{24\times 200-1}\right)(2\sqrt{3})}{24\times 200-1} - 2.83^0 \times 0.0000199006\exp\left(\frac{1}{6}\pi\sqrt{24\times 200-1}\right) =$$

$$0.000416753\exp\left(\frac{1}{6}\pi\sqrt{4798}\sum_{k=0}^{\infty}4798^{-k}\left(\frac{1}{2}\right)_k\right)\left(-0.0477514+\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\left(\frac{1}{2}\right)_k\right)$$

$$\frac{\exp\left(\frac{1}{6}\pi\sqrt{24\times 200-1}\right)(2\sqrt{3})}{24\times 200-1} - 2.83^0 \times 0.0000199006 \exp\left(\frac{1}{6}\pi\sqrt{24\times 200-1}\right) =$$

$$0.000416753 \exp\left(\frac{1}{6}\pi\sqrt{4798} \sum_{k=0}^{\infty} \frac{\left(-\frac{1}{4798}\right)^k \left(-\frac{1}{2}\right)_k}{k!}\right)$$

$$\left(-0.0477514 + \sqrt{2} \sum_{k=0}^{\infty} \frac{\left(-\frac{1}{2}\right)^k \left(-\frac{1}{2}\right)_k}{k!}\right)$$

$$\frac{\exp\left(\frac{1}{6}\pi\sqrt{24\times 200-1}\right)(2\sqrt{3})}{24\times 200-1} - 2.83^0 \times 0.0000199006 \exp\left(\frac{1}{6}\pi\sqrt{24\times 200-1}\right) =$$

$$0.000416753 \exp\left(\frac{1}{6}\pi\sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (4799-z_0)^k z_0^{-k}}{k!}\right)$$

$$\left(-0.0477514 + \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (3-z_0)^k z_0^{-k}}{k!}\right)$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

p(100):

$$(2\sqrt{3}) / (24*100-1) * \exp(1/6*Pi*\sqrt{24*100-1}) -$$

$$2.83*0.00001990058009(\exp(1/6*Pi*\sqrt{24*100-1}))$$

Input interpretation

$$\frac{2\sqrt{3}}{24\times 100-1} \exp\left(\frac{1}{6}\pi\sqrt{24\times 100-1}\right) +$$

$$2.83 \exp\left(\frac{1}{6}\pi\sqrt{24\times 100-1}\right) \times (-0.00001990058009)$$

Result

$$1.905671... \times 10^8$$

$$1.905671... * 10^8 \approx p(100)$$

Series representations

$$\frac{\exp\left(\frac{1}{6}\pi\sqrt{24\times 100-1}\right)(2\sqrt{3})}{24\times 100-1} - 2.83\times 0.0000199006 \exp\left(\frac{1}{6}\pi\sqrt{24\times 100-1}\right) =$$

$$0.000833681 \exp\left(\frac{1}{6}\pi\sqrt{2398}\sum_{k=0}^{\infty} 2398^{-k}\binom{\frac{1}{2}}{k}\right)\left(-0.0675542 + \sqrt{2}\sum_{k=0}^{\infty} 2^{-k}\binom{\frac{1}{2}}{k}\right)$$

$$\frac{\exp\left(\frac{1}{6}\pi\sqrt{24\times 100-1}\right)(2\sqrt{3})}{24\times 100-1} - 2.83\times 0.0000199006 \exp\left(\frac{1}{6}\pi\sqrt{24\times 100-1}\right) =$$

$$0.000833681 \exp\left(\frac{1}{6}\pi\sqrt{2398}\sum_{k=0}^{\infty} \frac{\left(-\frac{1}{2398}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)$$

$$\left(-0.0675542 + \sqrt{2}\sum_{k=0}^{\infty} \frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)$$

$$\frac{\exp\left(\frac{1}{6}\pi\sqrt{24\times 100-1}\right)(2\sqrt{3})}{24\times 100-1} - 2.83\times 0.0000199006 \exp\left(\frac{1}{6}\pi\sqrt{24\times 100-1}\right) =$$

$$0.000833681 \exp\left(\frac{1}{6}\pi\sqrt{z_0}\sum_{k=0}^{\infty} \frac{(-1)^k\left(-\frac{1}{2}\right)_k(2399-z_0)^k z_0^{-k}}{k!}\right)$$

$$\left(-0.0675542 + \sqrt{z_0}\sum_{k=0}^{\infty} \frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}\right)$$

for (not $(z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \leq 0)$)

p(50):

$$(2\sqrt{3}) / (24*50-1) * \exp(1/6*\text{Pi}*\sqrt{24*50-1}) -$$

$$2.83^2*0.00001990058009(\exp(1/6*\text{Pi}*\sqrt{24*50-1}))$$

Input interpretation

$$\frac{2\sqrt{3}}{24 \times 50 - 1} \exp\left(\frac{1}{6} \pi \sqrt{24 \times 50 - 1}\right) + \\ 2.83^2 \exp\left(\frac{1}{6} \pi \sqrt{24 \times 50 - 1}\right) \times (-0.00001990058009)$$

Result

204209.0...

$$204209 \approx p(50)$$

Series representations

$$\frac{\exp\left(\frac{1}{6} \pi \sqrt{24 \times 50 - 1}\right) (2\sqrt{3})}{24 \times 50 - 1} - 2.83^2 \times 0.0000199006 \exp\left(\frac{1}{6} \pi \sqrt{24 \times 50 - 1}\right) = \\ 0.00166806 \exp\left(\frac{1}{6} \pi \sqrt{1198}\right) \sum_{k=0}^{\infty} 1198^{-k} \left(\frac{1}{2}\right)_k \left(-0.0955494 + \sqrt{2} \sum_{k=0}^{\infty} 2^{-k} \left(\frac{1}{2}\right)_k\right)$$

$$\frac{\exp\left(\frac{1}{6} \pi \sqrt{24 \times 50 - 1}\right) (2\sqrt{3})}{24 \times 50 - 1} - 2.83^2 \times 0.0000199006 \exp\left(\frac{1}{6} \pi \sqrt{24 \times 50 - 1}\right) = \\ 0.00166806 \exp\left(\frac{1}{6} \pi \sqrt{1198}\right) \sum_{k=0}^{\infty} \frac{\left(-\frac{1}{1198}\right)^k \left(-\frac{1}{2}\right)_k}{k!} \\ \left(-0.0955494 + \sqrt{2} \sum_{k=0}^{\infty} \frac{\left(-\frac{1}{2}\right)^k \left(-\frac{1}{2}\right)_k}{k!}\right)$$

$$\frac{\exp\left(\frac{1}{6}\pi\sqrt{24\times 50-1}\right)(2\sqrt{3})}{24\times 50-1} - 2.83^2 \times 0.0000199006 \exp\left(\frac{1}{6}\pi\sqrt{24\times 50-1}\right) =$$

$$0.00166806 \exp\left(\frac{1}{6}\pi\sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (1199-z_0)^k z_0^{-k}}{k!}\right)$$

$$\left(-0.0955494 + \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (3-z_0)^k z_0^{-k}}{k!}\right)$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

p(25):

$$(2\sqrt{3}) / (24*25-1) * \exp(1/6*\text{Pi}*\sqrt{24*25-1}) -$$

$$2.83^3 * 0.00001990058009 (\exp(1/6*\text{Pi}*\sqrt{24*25-1}))$$

Input interpretation

$$\frac{2\sqrt{3}}{24\times 25-1} \exp\left(\frac{1}{6}\pi\sqrt{24\times 25-1}\right) +$$

$$2.83^3 \exp\left(\frac{1}{6}\pi\sqrt{24\times 25-1}\right) \times (-0.00001990058009)$$

Result

1960.185...

$$1960.185\dots \approx p(25)$$

Series representations

$$\frac{\exp\left(\frac{1}{6}\pi\sqrt{24\times 25-1}\right)(2\sqrt{3})}{24\times 25-1} - 2.83^3 \times 0.0000199006 \exp\left(\frac{1}{6}\pi\sqrt{24\times 25-1}\right) =$$

$$0.0033389 \exp\left(\frac{1}{6}\pi\sqrt{598} \sum_{k=0}^{\infty} 598^{-k} \left(\frac{1}{2}\right)_k\right) \left(-0.13509 + \sqrt{2} \sum_{k=0}^{\infty} 2^{-k} \left(\frac{1}{2}\right)_k\right)$$

$$\frac{\exp\left(\frac{1}{6}\pi\sqrt{24\times 25-1}\right)(2\sqrt{3})}{24\times 25-1} - 2.83^3 \times 0.0000199006 \exp\left(\frac{1}{6}\pi\sqrt{24\times 25-1}\right) =$$

$$0.0033389 \exp\left(\frac{1}{6}\pi\sqrt{598} \sum_{k=0}^{\infty} \frac{\left(-\frac{1}{598}\right)^k \left(-\frac{1}{2}\right)_k}{k!}\right) \left(-0.13509 + \sqrt{2} \sum_{k=0}^{\infty} \frac{\left(-\frac{1}{2}\right)^k \left(-\frac{1}{2}\right)_k}{k!}\right)$$

$$\frac{\exp\left(\frac{1}{6}\pi\sqrt{24\times 25-1}\right)(2\sqrt{3})}{24\times 25-1} - 2.83^3 \times 0.0000199006 \exp\left(\frac{1}{6}\pi\sqrt{24\times 25-1}\right) =$$

$$0.0033389 \exp\left(\frac{1}{6}\pi\sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (599-z_0)^k z_0^{-k}}{k!}\right)$$

$$\left(-0.13509 + \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (3-z_0)^k z_0^{-k}}{k!}\right)$$

for (not $(z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \leq 0)$)

Comparison with the black hole entropy

We consider always $p(200) = 3972999029388 = 3.972999029388 \times 10^{12}$

We have obtained, applying the last partition formula for $p(200)$:

$$(2\sqrt{3}) / (24*200-1) * \exp(1/6*Pi*\sqrt{24*200-1}) -$$

$$2.83^0 * 0.00001990058009 (\exp(1/6*Pi*\sqrt{24*200-1}))$$

Input interpretation

$$\frac{2\sqrt{3}}{24\times 200-1} \exp\left(\frac{1}{6}\pi\sqrt{24\times 200-1}\right) +$$

$$2.83^0 \exp\left(\frac{1}{6}\pi\sqrt{24\times 200-1}\right) \times (-0.00001990058009)$$

Result

$$3.97299902944... \times 10^{12}$$

$$3.97299902944... * 10^{12} \approx p(200)$$

Series representations

$$\frac{\exp\left(\frac{1}{6} \pi \sqrt{24 \times 200 - 1}\right) (2 \sqrt{3})}{24 \times 200 - 1} - 2.83^0 \times 0.0000199006 \exp\left(\frac{1}{6} \pi \sqrt{24 \times 200 - 1}\right) =$$

$$0.000416753 \exp\left(\frac{1}{6} \pi \sqrt{4798} \sum_{k=0}^{\infty} 4798^{-k} \binom{\frac{1}{2}}{k}\right) \left(-0.0477514 + \sqrt{2} \sum_{k=0}^{\infty} 2^{-k} \binom{\frac{1}{2}}{k}\right)$$

$$\frac{\exp\left(\frac{1}{6} \pi \sqrt{24 \times 200 - 1}\right) (2 \sqrt{3})}{24 \times 200 - 1} - 2.83^0 \times 0.0000199006 \exp\left(\frac{1}{6} \pi \sqrt{24 \times 200 - 1}\right) =$$

$$0.000416753 \exp\left(\frac{1}{6} \pi \sqrt{4798} \sum_{k=0}^{\infty} \frac{\left(-\frac{1}{4798}\right)^k \left(-\frac{1}{2}\right)_k}{k!}\right)$$

$$\left(-0.0477514 + \sqrt{2} \sum_{k=0}^{\infty} \frac{\left(-\frac{1}{2}\right)^k \left(-\frac{1}{2}\right)_k}{k!}\right)$$

$$\frac{\exp\left(\frac{1}{6} \pi \sqrt{24 \times 200 - 1}\right) (2 \sqrt{3})}{24 \times 200 - 1} - 2.83^0 \times 0.0000199006 \exp\left(\frac{1}{6} \pi \sqrt{24 \times 200 - 1}\right) =$$

$$0.000416753 \exp\left(\frac{1}{6} \pi \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (4799 - z_0)^k z_0^{-k}}{k!}\right)$$

$$\left(-0.0477514 + \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (3 - z_0)^k z_0^{-k}}{k!}\right)$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

We consider $p(200) = 3.97299902944... * 10^{12}$, $p(400)$ and $p(800)$ as black hole entropies. From the Hawking Radiation Calculator, we obtain the values of the mass, radius and temperature, for each solution. Indeed:

Mass = 0.0122380

Temperature = 1.00258e+25

Radius = 1.81754e-29

From the **Ramanujan-Nardelli mock modular formula**, we obtain:

$$\sqrt[32]{\left(\frac{1}{\left(\frac{4 \times 1.962364415 \times 10^{19}}{5 \times 0.0864055^2}\right) \times \frac{1}{0.0122380} \sqrt{-\frac{1.00258 \times 10^{25} \times 4 \pi (1.81754 \times 10^{-29})^3 - (1.81754 \times 10^{-29})^2}{6.67 \times 10^{-11}}}}\right)}\right)$$

Input interpretation

$$\sqrt[32]{\left(\frac{1}{\left(\frac{4 \times 1.962364415 \times 10^{19}}{5 \times 0.0864055^2}\right) \times \frac{1}{0.0122380} \sqrt{-\frac{1.00258 \times 10^{25} \times 4 \pi (1.81754 \times 10^{-29})^3 - (1.81754 \times 10^{-29})^2}{6.67 \times 10^{-11}}}}\right)}\right)$$

Result

1.6180806491402246534929344939696748876111829148638004010522507758

...

1.61808064914.... $\approx \phi$

And:

$$\frac{1}{\left(\sqrt[32]{\left(\frac{1}{\left(\frac{4 \times 1.962364415 \times 10^{19}}{5 \times 0.0864055^2}\right) \times \frac{1}{0.0122380} \sqrt{-\frac{1.00258 \times 10^{25} \times 4 \pi (1.81754 \times 10^{-29})^3 - (1.81754 \times 10^{-29})^2}{6.67 \times 10^{-11}}}}\right)}\right)}\right)^{1/32}}$$

Input interpretation

$$\sqrt[32]{\left(\frac{1}{\left(\frac{4 \times 1.962364415 \times 10^{19}}{5 \times 0.0864055^2}\right) \times \frac{1}{0.0122380} \sqrt{-\frac{1.00258 \times 10^{25} \times 4 \pi (1.81754 \times 10^{-29})^3 - (1.81754 \times 10^{-29})^2}{6.67 \times 10^{-11}}}}\right)}\right)$$

Result

0.9850737...

0.9850737.... result very near to the value of the following Rogers-Ramanujan continued fraction:

$$\frac{e^{-\frac{\pi}{\sqrt{5}}}}{\sqrt{5}} = 1 - \frac{e^{-\pi\sqrt{5}}}{1 + \frac{e^{-2\pi\sqrt{5}}}{1 + \frac{e^{-3\pi\sqrt{5}}}{1 + \frac{e^{-4\pi\sqrt{5}}}{1 + \dots}}}} \approx 0.9991104684$$

and to the Omega mesons ($\omega/\omega_3 \mid 5 + 3 \mid m_{u/d} = 255 - 390 \mid 0.988 - 1.18$) Regge slope value (0.988) connected to the dilaton scalar field **0.989117352243 = ϕ**

A_1^{**} above the two low-lying pseudo-scalars. (bound states of gluons, or 'glueballs')

A_1^{**}		0.943(39) [2.5]		0.988(38)		0.152(53)
A_4		1.03(10) [2.5]		0.999(32)		0.035(21)

(**Glueball Regge trajectories** - *Harvey Byron Meyer*, Lincoln College -Thesis submitted for the degree of Doctor of Philosophy at the University of Oxford Trinity Term, 2004)

We note that

$$\sqrt[32]{\zeta(2) - 1}$$

$$\sqrt[32]{\frac{\pi^2}{6} - 1}$$

$$= 0.9863870313564812915... (\pi^2/6 - 1)^{1/32}$$

For $p(400) = 6.7271435... \times 10^{18}$, we obtain:

Mass = 15.9245

Temperature = 7.70483e+21

Radius = 2.36505e-26

From which:

$\sqrt{\left(\frac{1}{\left(\frac{4 \times 1.962364415 \times 10^{19}}{5 \times 0.0864055^2}\right) \times \frac{1}{15.9245} \sqrt{-\frac{7.70483 \times 10^{21} \times 4 \pi (2.36505 \times 10^{-26})^3 - (2.36505 \times 10^{-26})^2}{6.67 \times 10^{-11}}}\right)}\right)}$

Input interpretation

$$\sqrt{\frac{1}{\frac{4 \times 1.962364415 \times 10^{19}}{5 \times 0.0864055^2} \times \frac{1}{15.9245} \sqrt{-\frac{7.70483 \times 10^{21} \times 4 \pi (2.36505 \times 10^{-26})^3 - (2.36505 \times 10^{-26})^2}{6.67 \times 10^{-11}}}}}$$

Result

1.6180788003254757620215181979161402691365940272129782506661769680

...

1.618078800325.... $\approx \phi$

And again:

$\frac{1}{\left(\sqrt{\left(\frac{1}{\left(\frac{4 \times 1.962364415 \times 10^{19}}{5 \times 0.0864055^2}\right) \times \frac{1}{15.9245} \sqrt{-\frac{7.70483 \times 10^{21} \times 4 \pi (2.36505 \times 10^{-26})^3 - (2.36505 \times 10^{-26})^2}{6.67 \times 10^{-11}}}\right)}\right)}\right)^{1/32}}$

Input interpretation

$$\sqrt[32]{\sqrt{\frac{1}{\frac{4 \times 1.962364415 \times 10^{19}}{5 \times 0.0864055^2} \times \frac{1}{15.9245} \sqrt{-\frac{7.70483 \times 10^{21} \times 4 \pi (2.36505 \times 10^{-26})^3 - (2.36505 \times 10^{-26})^2}{6.67 \times 10^{-11}}}}}}$$

Result

0.9850738...

0.9850738.... as above

For $p(800) = 5.7331225... \times 10^{27}$, we obtain:

Mass = 464886

Temperature = $2.63927e+17$

Radius = $6.90432e-22$

From which:

$\sqrt{\left(\frac{1}{\left(\frac{4 \times 1.962364415e+19}{5 \times 0.0864055^2}\right) \times \frac{1}{464886}}\right) \times \sqrt{\left(-\frac{2.63927e+17 \times 4 \pi (6.90432e-22)^3 - (6.90432e-22)^2}{6.67 \times 10^{-11}}\right)}}$

Input interpretation

$$\sqrt{\frac{1}{\frac{4 \times 1.962364415 \times 10^{19}}{5 \times 0.0864055^2} \times \frac{1}{464886} \sqrt{-\frac{2.63927 \times 10^{17} \times 4 \pi (6.90432 \times 10^{-22})^3 - (6.90432 \times 10^{-22})^2}{6.67 \times 10^{-11}}}}}$$

Result

1.6180789473527642039118948505160085539860739678816750916391012449

...

1.61807894735.... $\approx \phi$

And again:

$$\frac{1}{\sqrt{\left(\frac{1}{\left(\frac{4 \times 1.962364415 \times 10^{19}}{5 \times 0.0864055^2}\right) \times \frac{1}{464886}} \sqrt{\left(-\frac{\left(\frac{2.63927 \times 10^{17} \times 4 \pi (6.90432 \times 10^{-22})^3 - (6.90432 \times 10^{-22})^2}{6.67 \times 10^{-11}}\right)}{1}\right)}\right)}\right)}^{1/32}$$

Input interpretation

$$\sqrt[32]{\sqrt{\frac{1}{\frac{4 \times 1.962364415 \times 10^{19}}{5 \times 0.0864055^2} \times \frac{1}{464886} \sqrt{\frac{1}{-\frac{2.63927 \times 10^{17} \times 4 \pi (6.90432 \times 10^{-22})^3 - (6.90432 \times 10^{-22})^2}{6.67 \times 10^{-11}}}}}}}$$

Result

0.9850738...

0.9850738.... as above

From the values of the three calculated masses

0.0122380; 15.9245; 464886

after some calculations, we obtain:

$$\frac{1}{55-3} (0.0122380 \times 15.9245 \times 464886) - 13 - \frac{(\sqrt{10-2\sqrt{5}} - 2)(\sqrt{5}-1)}{1}$$

Input interpretation

$$\frac{1}{55-3} (0.0122380 \times 15.9245 \times 464886) - 13 - \frac{\sqrt{10-2\sqrt{5}} - 2}{\sqrt{5}-1}$$

Result

1729.00...

1729

This result is very near to the mass of candidate glueball **$f_0(1710)$ scalar meson**. Furthermore, 1728 occurs in the algebraic formula for the j-invariant of an elliptic curve. ($1728 = 8^2 * 3^3$) The number 1728 is one less than the Hardy–Ramanujan number 1729 (taxicab number)

$$(1/(55-3)(0.0122380 \times 15.9245 \times 464886) - 13 - (((\sqrt{10-2\sqrt{5}} - 2))(\sqrt{5}-1))))^{1/15}$$

Input interpretation

$$\sqrt[15]{\frac{1}{55-3} (0.0122380 \times 15.9245 \times 464886) - 13 - \frac{\sqrt{10-2\sqrt{5}} - 2}{\sqrt{5} - 1}}$$

Result

1.6438153329942096374960167871465120280448066256376775180753380930

...

$$1.64381533.... \approx \zeta(2) = \frac{\pi^2}{6} = 1.644934 ...$$

$$(1/27(1/(55-3)(0.0122380 \times 15.9245 \times 464886) - 13 - (((\sqrt{10-2\sqrt{5}} - 2))(\sqrt{5}-1)))) - 1))^{2+276}$$

Input interpretation

$$\left(\frac{1}{27} \left(\frac{1}{55-3} (0.0122380 \times 15.9245 \times 464886) - 13 - \frac{\sqrt{10-2\sqrt{5}} - 2}{\sqrt{5} - 1} - 1 \right) \right)^2 + 276$$

Result

4372.01...

$$4372.01.... \approx 4372$$

where 4372 is a value indicated in the fundamental Ramanujan paper “**Modular equations and Approximations to π** ”

Hence

$$\begin{aligned} 64g_{22}^{24} &= e^{\pi\sqrt{22}} - 24 + 276e^{-\pi\sqrt{22}} - \dots, \\ 64g_{22}^{-24} &= 4096e^{-\pi\sqrt{22}} + \dots, \end{aligned}$$

so that

$$64(g_{22}^{24} + g_{22}^{-24}) = e^{\pi\sqrt{22}} - 24 + 4372e^{-\pi\sqrt{22}} + \dots = 64\{(1 + \sqrt{2})^{12} + (1 - \sqrt{2})^{12}\}.$$

Hence

$$e^{\pi\sqrt{22}} = 2508951.9982\dots$$

$$2((1/27(1/(55-3)(0.0122380 * 15.9245 * 464886)-13-(((\sqrt{(10-2\sqrt{5})}-2))/(\sqrt{5}-1)))-1))^2)$$

Input interpretation

$$2\left(\frac{1}{27}\left(\frac{1}{55-3}(0.0122380 \times 15.9245 \times 464886) - 13 - \frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1} - 1\right)\right)^2$$

Result

8192.02...

8192.02.... $\approx$ 8192

The total amplitude vanishes for gauge group SO(8192), while the vacuum energy is negative and independent of the gauge group.

The vacuum energy and dilaton tadpole to lowest non-trivial order for the open bosonic string. While the vacuum energy is non-zero and independent of the gauge group, the dilaton tadpole is zero for a unique choice of gauge group, SO(2^{13}) i.e. SO(8192). (From: “Dilaton Tadpole for the Open Bosonic String “ Michael R. Douglas and Benjamin Grinstein - September 2,1986)

Mathematical connections with some sectors of String Theory

From:

Modular equations and approximations to π - Srinivasa Ramanujan
Quarterly Journal of Mathematics, XLV, 1914, 350 – 372

We have that:

Hence

$$\begin{aligned} 64g_{22}^{24} &= e^{\pi\sqrt{22}} - 24 + 276e^{-\pi\sqrt{22}} - \dots, \\ 64g_{22}^{-24} &= 4096e^{-\pi\sqrt{22}} + \dots, \end{aligned}$$

so that

$$64(g_{22}^{24} + g_{22}^{-24}) = e^{\pi\sqrt{22}} - 24 + 4372e^{-\pi\sqrt{22}} + \dots = 64\{(1 + \sqrt{2})^{12} + (1 - \sqrt{2})^{12}\}.$$

Hence

$$e^{\pi\sqrt{22}} = 2508951.9982\dots$$

Again

$$G_{37} = (6 + \sqrt{37})^{\frac{1}{4}},$$

$$\begin{aligned} 64G_{37}^{24} &= e^{\pi\sqrt{37}} + 24 + 276e^{-\pi\sqrt{37}} + \dots, \\ 64G_{37}^{-24} &= 4096e^{-\pi\sqrt{37}} - \dots, \end{aligned}$$

so that

$$64(G_{37}^{24} + G_{37}^{-24}) = e^{\pi\sqrt{37}} + 24 + 4372e^{-\pi\sqrt{37}} - \dots = 64\{(6 + \sqrt{37})^6 + (6 - \sqrt{37})^6\}.$$

Hence

$$e^{\pi\sqrt{37}} = 199148647.999978\dots$$

Similarly, from

$$g_{58} = \sqrt{\left(\frac{5 + \sqrt{29}}{2}\right)},$$

we obtain

$$64(g_{58}^{24} + g_{58}^{-24}) = e^{\pi\sqrt{58}} - 24 + 4372e^{-\pi\sqrt{58}} + \dots = 64\left\{\left(\frac{5 + \sqrt{29}}{2}\right)^{12} + \left(\frac{5 - \sqrt{29}}{2}\right)^{12}\right\}.$$

Hence

$$e^{\pi\sqrt{58}} = 24591257751.99999982\dots$$

From:

An Update on Brane Supersymmetry Breaking

J. Mourad and A. Sagnotti - arXiv:1711.11494v1 [hep-th] 30 Nov 2017

From the following vacuum equations:

$$T e^{\gamma_E \phi} = - \frac{\beta_E^{(p)} h^2}{\gamma_E} e^{-2(8-p)C + 2\beta_E^{(p)} \phi}$$

$$16 k' e^{-2C} = \frac{h^2 \left(p + 1 - \frac{2\beta_E^{(p)}}{\gamma_E} \right) e^{-2(8-p)C + 2\beta_E^{(p)} \phi}}{(7-p)}$$

$$(A')^2 = k e^{-2A} + \frac{h^2}{16(p+1)} \left(7 - p + \frac{2\beta_E^{(p)}}{\gamma_E} \right) e^{-2(8-p)C + 2\beta_E^{(p)} \phi}$$

we have obtained, from the results almost equals of the equations, putting

$4096 e^{-\pi\sqrt{18}}$ instead of

$$e^{-2(8-p)C + 2\beta_E^{(p)} \phi}$$

a new possible mathematical connection between the two exponentials. Thence, also the values concerning p , C , β_E and ϕ correspond to the exponents of e (i.e. of exp). Thence we obtain for $p = 5$ and $\beta_E = 1/2$:

$$e^{-6C+\phi} = 4096 e^{-\pi\sqrt{18}}$$

Therefore, with respect to the exponentials of the vacuum equations, the Ramanujan's exponential has a coefficient of 4096 which is equal to 642, while $-6C+\phi$ is equal to $-\pi\sqrt{18}$. From this it follows that it is possible to establish mathematically, the dilaton value.

For

$\exp((- \pi \sqrt{18}))$ we obtain:

Input:

$$\exp\left(-\pi \sqrt{18}\right)$$

Exact result:

$$e^{-3\sqrt{2}\pi}$$

Decimal approximation:

$$1.6272016226072509292942156739117979541838581136954016... \times 10^{-6}$$

$$1.6272016... * 10^{-6}$$

Property:

$e^{-3\sqrt{2}\pi}$ is a transcendental number

Series representations:

$$e^{-\pi \sqrt{18}} = e^{-\pi \sqrt{17} \sum_{k=0}^{\infty} 17^{-k} \binom{1/2}{k}}$$

$$e^{-\pi \sqrt{18}} = \exp\left(-\pi \sqrt{17} \sum_{k=0}^{\infty} \frac{\left(-\frac{1}{17}\right)^k \left(-\frac{1}{2}\right)_k}{k!}\right)$$

$$e^{-\pi \sqrt{18}} = \exp\left(-\frac{\pi \sum_{j=0}^{\infty} \operatorname{Res}_{s=-\frac{1}{2}+j} 17^{-s} \Gamma\left(-\frac{1}{2}-s\right) \Gamma(s)}{2\sqrt{\pi}}\right)$$

Now, we have the following calculations:

$$e^{-6C+\phi} = 4096e^{-\pi\sqrt{18}}$$

$$e^{-\pi\sqrt{18}} = 1.6272016... * 10^{-6}$$

from which:

$$\frac{1}{4096} e^{-6C+\phi} = 1.6272016... * 10^{-6}$$

$$0.000244140625 e^{-6C+\phi} = e^{-\pi\sqrt{18}} = 1.6272016... * 10^{-6}$$

Now:

$$\ln(e^{-\pi\sqrt{18}}) = -13.328648814475 = -\pi\sqrt{18}$$

And:

$$(1.6272016 * 10^{-6}) * 1 / (0.000244140625)$$

Input interpretation:

$$\frac{1.6272016}{10^6} \times \frac{1}{0.000244140625}$$

Result:

0.0066650177536

0.006665017...

Thence:

$$0.000244140625 e^{-6C+\phi} = e^{-\pi\sqrt{18}}$$

Dividing both sides by 0.000244140625, we obtain:

$$\frac{0.000244140625}{0.000244140625} e^{-6C+\phi} = \frac{1}{0.000244140625} e^{-\pi\sqrt{18}}$$

$$e^{-6C+\phi} = 0.0066650177536$$

$$((((\exp((-Pi*\sqrt{18})))))))*1/0.000244140625$$

Input interpretation:

$$\exp\left(-\pi\sqrt{18}\right)\times\frac{1}{0.000244140625}$$

Result:

0.00666501785...

0.00666501785...

Series representations:

$$\frac{\exp(-\pi\sqrt{18})}{0.000244141} = 4096 \exp\left(-\pi\sqrt{17} \sum_{k=0}^{\infty} 17^{-k} \left(\frac{1}{2}\right)_k\right)$$

$$\frac{\exp(-\pi\sqrt{18})}{0.000244141} = 4096 \exp\left(-\pi\sqrt{17} \sum_{k=0}^{\infty} \frac{\left(-\frac{1}{17}\right)^k \left(-\frac{1}{2}\right)_k}{k!}\right)$$

$$\frac{\exp(-\pi\sqrt{18})}{0.000244141} = 4096 \exp\left(-\frac{\pi \sum_{j=0}^{\infty} \operatorname{Res}_{s=-\frac{1}{2}+j} 17^{-s} \Gamma\left(-\frac{1}{2}-s\right) \Gamma(s)}{2\sqrt{\pi}}\right)$$

Now:

$$e^{-6C+\phi} = 0.0066650177536$$

$$\exp\left(-\pi\sqrt{18}\right)\times\frac{1}{0.000244140625} =$$

$$e^{-\pi\sqrt{18}}\times\frac{1}{0.000244140625}$$

$$= 0.00666501785\dots$$

From:

$$\ln(0.00666501784619)$$

Input interpretation:

$$\log(0.00666501784619)$$

Result:

$$-5.010882647757\dots$$

$$-5.010882647757\dots$$

Alternative representations:

$$\log(0.006665017846190000) = \log_e(0.006665017846190000)$$

$$\log(0.006665017846190000) = \log(a) \log_a(0.006665017846190000)$$

$$\log(0.006665017846190000) = -\text{Li}_1(0.993334982153810000)$$

Series representations:

$$\log(0.006665017846190000) = -\sum_{k=1}^{\infty} \frac{(-1)^k (-0.993334982153810000)^k}{k}$$

$$\log(0.006665017846190000) = 2i\pi \left[\frac{\arg(0.006665017846190000 - x)}{2\pi} \right] + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (0.006665017846190000 - x)^k x^{-k}}{k} \quad \text{for } x < 0$$

$$\log(0.006665017846190000) = \left[\frac{\arg(0.006665017846190000 - z_0)}{2\pi} \right] \log\left(\frac{1}{z_0}\right) + \log(z_0) + \left[\frac{\arg(0.006665017846190000 - z_0)}{2\pi} \right] \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (0.006665017846190000 - z_0)^k z_0^{-k}}{k}$$

Integral representation:

$$\log(0.006665017846190000) = \int_1^{0.006665017846190000} \frac{1}{t} dt$$

In conclusion:

$$-6C + \phi = -5.010882647757 \dots$$

and for $C = 1$, we obtain:

$$\phi = -5.010882647757 + 6 = \mathbf{0.989117352243} = \phi$$

Note that the values of n_s (spectral index) 0.965, of the average of the Omega mesons Regge slope 0.987428571 and of the dilaton 0.989117352243, are also connected to the following two Rogers-Ramanujan continued fractions:

$$\frac{e^{-\frac{\pi}{5}}}{\sqrt{(\varphi-1)\sqrt{5}} - \varphi + 1} = 1 - \frac{e^{-\pi}}{1 + \frac{e^{-2\pi}}{1 + \frac{e^{-3\pi}}{1 + \frac{e^{-4\pi}}{1 + \dots}}}} \approx 0.9568666373$$

$$\frac{e^{-\frac{\pi}{\sqrt{5}}}}{\sqrt{5} - \varphi + 1} = 1 - \frac{e^{-\pi\sqrt{5}}}{1 + \frac{e^{-2\pi\sqrt{5}}}{1 + \frac{e^{-3\pi\sqrt{5}}}{1 + \frac{e^{-4\pi\sqrt{5}}}{1 + \dots}}}} \approx 0.9991104684$$

(<http://www.bitman.name/math/article/102/109/>)

The mean between the two results of the above Rogers-Ramanujan continued fractions is 0.97798855285, value very near to the ψ Regge slope 0.979:

Ψ		3		$m_c = 1500$		0.979		-0.09
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Also performing the 512th root of the inverse value of the Pion meson rest mass 139.57, we obtain:

$$((1/(139.57)))^{1/512}$$

Input interpretation:

$$\sqrt[512]{\frac{1}{139.57}}$$

Result:

0.990400732708644027550973755713301415460732796178555551684...

0.99040073.... result very near to the dilaton value **0.989117352243 = ϕ** and to the value of the following Rogers-Ramanujan continued fraction:

$$\frac{\frac{e^{-\frac{\pi}{\sqrt{5}}}}{\sqrt{5}}}{1 + \sqrt[5]{\sqrt{\phi^5 \sqrt[4]{5^3}} - 1}} = 1 - \frac{e^{-\pi\sqrt{5}}}{1 + \frac{e^{-2\pi\sqrt{5}}}{1 + \frac{e^{-3\pi\sqrt{5}}}{1 + \frac{e^{-4\pi\sqrt{5}}}{1 + \dots}}}} \approx 0.9991104684$$

From

AdS Vacua from Dilaton Tadpoles and Form Fluxes - *J. Mourad and A. Sagnotti*
 - arXiv:1612.08566v2 [hep-th] 22 Feb 2017 - March 27, 2018

We have:

$$e^{2C} = \frac{2\xi e^{\frac{\phi}{2}}}{1 \pm \sqrt{1 - \frac{\xi T}{3} e^{2\phi}}}$$

$$\frac{h^2}{32} = \frac{\xi^7 e^{4\phi}}{\left(1 \pm \sqrt{1 - \frac{\xi T}{3} e^{2\phi}}\right)^7} \left[\frac{42}{\xi} \left(1 \pm \sqrt{1 - \frac{\xi T}{3} e^{2\phi}}\right) + 5 T e^{2\phi} \right]. \quad (2.7)$$

For

$$T = \frac{16}{\pi^2}$$

$$\xi = 1$$

we obtain:

$$(2 \cdot e^{(0.989117352243/2)}) / (1 + \sqrt{((1 - 1/3 \cdot 16/(\pi)^2 \cdot e^{2 \cdot 0.989117352243})))})$$

Input interpretation:

$$\frac{2 e^{0.989117352243/2}}{1 + \sqrt{1 - \frac{1}{3} \times \frac{16}{\pi^2} e^{2 \times 0.989117352243}}}$$

Result:

0.83941881822... -
1.4311851867... *i*

Polar coordinates:

$r = 1.65919106525$ (radius), $\theta = -59.607521917^\circ$ (angle)

1.65919106525..... result very near to the 14th root of the following Ramanujan's class invariant $Q = (G_{505}/G_{101/5})^3 = 1164.2696$ i.e. 1.65578...

Series representations:

$$\frac{2 e^{0.9891173522430000/2}}{1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}}} = \frac{2 e^{0.4945586761215000}}{1 + \sqrt{-\frac{16 e^{1.978234704486000}}{3 \pi^2}} \sum_{k=0}^{\infty} \left(\frac{3}{16}\right)^k \left(-\frac{e^{1.978234704486000}}{\pi^2}\right)^{-k} \left(\frac{1}{2}\right)_k}$$

$$\frac{2 e^{0.9891173522430000/2}}{1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}}} = \frac{2 e^{0.4945586761215000}}{1 + \sqrt{-\frac{16 e^{1.978234704486000}}{3 \pi^2}} \sum_{k=0}^{\infty} \frac{\left(-\frac{3}{16}\right)^k \left(-\frac{e^{1.978234704486000}}{\pi^2}\right)^{-k} \left(-\frac{1}{2}\right)_k}{k!}}$$

$$\frac{2 e^{0.9891173522430000/2}}{1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}}} = \frac{2 e^{0.4945586761215000}}{1 + \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 - \frac{16 e^{1.978234704486000}}{3 \pi^2} z_0\right)^k z_0^{-k}}{k!}}$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

From

$$\frac{h^2}{32} = \frac{\xi^7 e^{4\phi}}{\left(1 \pm \sqrt{1 - \frac{\xi T}{3} e^{2\phi}}\right)^7} \left[\frac{42}{\xi} \left(1 \pm \sqrt{1 - \frac{\xi T}{3} e^{2\phi}}\right) + 5 T e^{2\phi} \right]$$

we obtain:

$$e^{(4 \times 0.989117352243) / (((1 + \sqrt{1 - 1/3 \times 16 / (\pi)^2 \times e^{(2 \times 0.989117352243)}}))^{1/7} [42(1 + \sqrt{1 - 1/3 \times 16 / (\pi)^2 \times e^{(2 \times 0.989117352243)}}) + 5 \times 16 / (\pi)^2 \times e^{(2 \times 0.989117352243)}]}$$

Input interpretation:

$$\frac{e^{4 \times 0.989117352243}}{\left(1 + \sqrt{1 - \frac{1}{3} \times \frac{16}{\pi^2} e^{2 \times 0.989117352243}}\right)^7} \left(42 \left(1 + \sqrt{1 - \frac{1}{3} \times \frac{16}{\pi^2} e^{2 \times 0.989117352243}}\right) + 5 \times \frac{16}{\pi^2} e^{2 \times 0.989117352243}\right)$$

Result:

50.84107889... –
20.34506335... *i*

Polar coordinates:

$r = 54.76072411$ (radius), $\theta = -21.80979492^\circ$ (angle)

54.76072411.....

Series representations:

$$\begin{aligned}
& \left(\left(42 \left(1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}} \right) + \frac{5 \times 16 e^{2 \times 0.9891173522430000}}{\pi^2} \right) \right. \\
& \quad \left. e^{4 \times 0.9891173522430000} \right) / \left(1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}} \right)^7 = \\
& \left(2 \left(40 e^{5.934704113458000} + 21 e^{3.956469408972000} \pi^2 + 21 e^{3.956469408972000} \pi^2 \right. \right. \\
& \quad \left. \left. \sqrt{-\frac{16 e^{1.978234704486000}}{3 \pi^2}} \sum_{k=0}^{\infty} \left(\frac{3}{16} \right)^k \left(-\frac{e^{1.978234704486000}}{\pi^2} \right)^{-k} \left(\frac{1}{2} \right)_k \right) \right) / \\
& \quad \left(\pi^2 \left(1 + \sqrt{-\frac{16 e^{1.978234704486000}}{3 \pi^2}} \sum_{k=0}^{\infty} \left(\frac{3}{16} \right)^k \left(-\frac{e^{1.978234704486000}}{\pi^2} \right)^{-k} \left(\frac{1}{2} \right)_k \right) \right)^7 \Bigg) \\
& \left(\left(42 \left(1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}} \right) + \frac{5 \times 16 e^{2 \times 0.9891173522430000}}{\pi^2} \right) \right. \\
& \quad \left. e^{4 \times 0.9891173522430000} \right) / \left(1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}} \right)^7 = \\
& \left(2 \left(40 e^{5.934704113458000} + 21 e^{3.956469408972000} \pi^2 + 21 e^{3.956469408972000} \pi^2 \right. \right. \\
& \quad \left. \left. \sqrt{-\frac{16 e^{1.978234704486000}}{3 \pi^2}} \sum_{k=0}^{\infty} \frac{\left(-\frac{3}{16} \right)^k \left(-\frac{e^{1.978234704486000}}{\pi^2} \right)^{-k} \left(-\frac{1}{2} \right)_k}{k!} \right) \right) / \\
& \quad \left(\pi^2 \left(1 + \sqrt{-\frac{16 e^{1.978234704486000}}{3 \pi^2}} \sum_{k=0}^{\infty} \frac{\left(-\frac{3}{16} \right)^k \left(-\frac{e^{1.978234704486000}}{\pi^2} \right)^{-k} \left(-\frac{1}{2} \right)_k}{k!} \right) \right)^7 \Bigg)
\end{aligned}$$

$$\left(\left(42 \left(1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}} \right) + \frac{5 \times 16 e^{2 \times 0.9891173522430000}}{\pi^2} \right) e^{4 \times 0.9891173522430000} \right) / \left(1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}} \right)^7 =$$

$$\left(2 \left(40 e^{5.934704113458000} + 21 e^{3.956469408972000} \pi^2 + 21 e^{3.956469408972000} \right. \right.$$

$$\left. \left. \pi^2 \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 - \frac{16 e^{1.978234704486000}}{3 \pi^2} - z_0\right)^k z_0^{-k}}{k!} \right) \right) /$$

$$\left(\pi^2 \left(1 + \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 - \frac{16 e^{1.978234704486000}}{3 \pi^2} - z_0\right)^k z_0^{-k}}{k!} \right)^7 \right)$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

From which:

$$e^{(4 \times 0.989117352243)} / (((1 + \sqrt{1 - \frac{16}{3 \pi^2} e^{(2 \times 0.989117352243)}}))^7 [42(1 + \sqrt{1 - \frac{16}{3 \pi^2} e^{(2 \times 0.989117352243)}}) + 5 \times \frac{16}{\pi^2} e^{(2 \times 0.989117352243)}] \times \frac{1}{34})$$

Input interpretation:

$$\frac{e^{4 \times 0.989117352243}}{\left(1 + \sqrt{1 - \frac{1}{3} \times \frac{16}{\pi^2} e^{2 \times 0.989117352243}} \right)^7 \left(42 \left(1 + \sqrt{1 - \frac{1}{3} \times \frac{16}{\pi^2} e^{2 \times 0.989117352243}} \right) + 5 \times \frac{16}{\pi^2} e^{2 \times 0.989117352243} \right) \times \frac{1}{34}}$$

Result:

$$1.495325850... - 0.5983842161... i$$

Polar coordinates:

$$r = 1.610609533 \text{ (radius), } \theta = -21.80979492^\circ \text{ (angle)}$$

1.610609533.... result that is a good approximation to the value of the golden ratio
1.618033988749...

Series representations:

$$\begin{aligned}
& \left(\left(42 \left(1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}} \right) + \frac{5 \times 16 e^{2 \times 0.9891173522430000}}{\pi^2} \right) \right. \\
& \quad \left. e^{4 \times 0.9891173522430000} \right) / \left(34 \left(1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}} \right) \right)^7 = \\
& \left(40 e^{5.934704113458000} + 21 e^{3.956469408972000} \pi^2 + 21 e^{3.956469408972000} \pi^2 \right. \\
& \quad \left. \sqrt{-\frac{16 e^{1.978234704486000}}{3 \pi^2}} \sum_{k=0}^{\infty} \left(\frac{3}{16} \right)^k \left(-\frac{e^{1.978234704486000}}{\pi^2} \right)^{-k} \left(\frac{1}{2} \right)_k \right) / \\
& \quad \left(17 \pi^2 \left(1 + \sqrt{-\frac{16 e^{1.978234704486000}}{3 \pi^2}} \sum_{k=0}^{\infty} \left(\frac{3}{16} \right)^k \left(-\frac{e^{1.978234704486000}}{\pi^2} \right)^{-k} \left(\frac{1}{2} \right)_k \right) \right)^7 \Bigg) \\
& \left(\left(42 \left(1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}} \right) + \frac{5 \times 16 e^{2 \times 0.9891173522430000}}{\pi^2} \right) \right. \\
& \quad \left. e^{4 \times 0.9891173522430000} \right) / \left(34 \left(1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}} \right) \right)^7 = \\
& \left(40 e^{5.934704113458000} + 21 e^{3.956469408972000} \pi^2 + 21 e^{3.956469408972000} \pi^2 \right. \\
& \quad \left. \sqrt{-\frac{16 e^{1.978234704486000}}{3 \pi^2}} \sum_{k=0}^{\infty} \frac{\left(-\frac{3}{16} \right)^k \left(-\frac{e^{1.978234704486000}}{\pi^2} \right)^{-k} \left(-\frac{1}{2} \right)_k}{k!} \right) / \\
& \quad \left(17 \pi^2 \left(1 + \sqrt{-\frac{16 e^{1.978234704486000}}{3 \pi^2}} \sum_{k=0}^{\infty} \frac{\left(-\frac{3}{16} \right)^k \left(-\frac{e^{1.978234704486000}}{\pi^2} \right)^{-k} \left(-\frac{1}{2} \right)_k}{k!} \right) \right)^7 \Bigg)
\end{aligned}$$

$$\begin{aligned}
& \left(\left(42 \left(1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}} \right) + \frac{5 \times 16 e^{2 \times 0.9891173522430000}}{\pi^2} \right) \right. \\
& \quad \left. e^{4 \times 0.9891173522430000} \right) / \left(34 \left(1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}} \right) \right)^7 = \\
& \left(40 e^{5.934704113458000} + 21 e^{3.956469408972000} \pi^2 + 21 e^{3.956469408972000} \right. \\
& \quad \left. \pi^2 \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 - \frac{16 e^{1.978234704486000}}{3 \pi^2} - z_0\right)^k z_0^{-k}}{k!} \right) / \\
& \left(17 \pi^2 \left(1 + \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 - \frac{16 e^{1.978234704486000}}{3 \pi^2} - z_0\right)^k z_0^{-k}}{k!} \right) \right)^7 \\
& \text{for (not } (z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \leq 0))
\end{aligned}$$

Now, we have:

$$e^{2C} = \frac{2\xi e^{-\frac{\phi}{2}}}{1 + \sqrt{1 + \frac{\xi\Lambda}{3} e^{2\phi}}}, \quad (2.9)$$

$$\frac{h^2}{32} = \frac{e^{-4\phi}}{\left[1 + \sqrt{1 + \frac{\Lambda}{3} e^{2\phi}}\right]^7} \left[42 \left(1 + \sqrt{1 + \frac{\Lambda}{3} e^{2\phi}}\right) - 13\Lambda e^{2\phi}\right]. \quad (2.10)$$

For:

$$\xi = 1$$

$$\Lambda \simeq \frac{4\pi^2}{25}$$

$$\phi = 0.989117352243$$

From

$$e^{2C} = \frac{2\xi e^{-\frac{\phi}{2}}}{1 + \sqrt{1 + \frac{\xi\Lambda}{3} e^{2\phi}}},$$

we obtain:

$$\frac{((2 * e^{(-0.989117352243/2)}))}{((((1 + \sqrt{(1 + 1/3 * (4\pi^2)/25 * e^{(2 * 0.989117352243)})))))}$$

Input interpretation:

$$\frac{2 e^{-0.989117352243/2}}{1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \cdot 0.989117352243}}}$$

Result:

0.382082347529...

0.382082347529....

Series representations:

$$\frac{2 e^{-0.9891173522430000/2}}{1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}}} = 2 / \left(e^{0.4945586761215000} \left(1 + \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k (e^{1.978234704486000} \pi^2)^{-k} \left(\frac{1}{2} \right)_k \right) \right)$$

$$\frac{2 e^{-0.9891173522430000/2}}{1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}}} = 2 / \left(e^{0.4945586761215000} \left(1 + \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4} \right)^k (e^{1.978234704486000} \pi^2)^{-k} \left(-\frac{1}{2} \right)_k}{k!} \right) \right)$$

$$\frac{2 e^{-0.9891173522430000/2}}{1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}}} = \frac{2}{e^{0.4945586761215000} \left(1 + \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 + \frac{4 e^{1.978234704486000} \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!} \right)}$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

From which:

$$1 + 1 / (((4 * (2 * e^{(-0.989117352243/2)})) / (((1 + \sqrt{1 + 1/3 * (4 \pi^2)/25 * e^{(2 * 0.989117352243)}}))))))$$

Input interpretation:

$$1 + \frac{1}{4 \times \frac{2 e^{-0.989117352243/2}}{1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2)\right) e^{2 \times 0.989117352243}}}}$$

Result:

1.65430921270...

1.6543092..... We note that, the result 1.6543092... is very near to the 14th root of the following Ramanujan's class invariant $Q = (G_{505}/G_{101/5})^3 = 1164.2696$ i.e. 1.65578...

Indeed:

$$G_{505} = P^{-1/4}Q^{1/6} = (\sqrt{5} + 2)^{1/2} \left(\frac{\sqrt{5} + 1}{2} \right)^{1/4} (\sqrt{101} + 10)^{1/4} \\ \times \left((130\sqrt{5} + 29\sqrt{101}) + \sqrt{169440 + 7540\sqrt{505}} \right)^{1/6}.$$

Thus, it remains to show that

$$(130\sqrt{5} + 29\sqrt{101}) + \sqrt{169440 + 7540\sqrt{505}} = \left(\sqrt{\frac{113 + 5\sqrt{505}}{8}} + \sqrt{\frac{105 + 5\sqrt{505}}{8}} \right)^3,$$

which is straightforward. $\square$

$$\sqrt[14]{\left(\sqrt{\frac{113+5\sqrt{505}}{8}} + \sqrt{\frac{105+5\sqrt{505}}{8}} \right)^3} = 1,65578 \dots$$

Series representations:

$$1 + \frac{1}{4 \left(2 e^{-0.9891173522430000/2} \right)} = \\ \frac{1 + \sqrt{1 + \frac{(4\pi^2)e^{2 \times 0.9891173522430000}}{3 \times 25}}}{1 + \frac{e^{0.4945586761215000}}{8} + \frac{1}{8} e^{0.4945586761215000} \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}}} \\ \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k \left(e^{1.978234704486000} \pi^2 \right)^{-k} \left(\frac{1}{2} \right)_k$$

$$1 + \frac{1}{4 \left(2 e^{-0.9891173522430000/2} \right)} = \\ \frac{1 + \sqrt{1 + \frac{(4\pi^2)e^{2 \times 0.9891173522430000}}{3 \times 25}}}{1 + \frac{e^{0.4945586761215000}}{8} + \frac{1}{8} e^{0.4945586761215000} \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}}} \\ \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4} \right)^k \left(e^{1.978234704486000} \pi^2 \right)^{-k} \left(-\frac{1}{2} \right)_k}{k!}$$

$$1 + \frac{1}{4 \left(2 e^{-0.9891173522430000/2} \right)} = 1 + \frac{e^{0.4945586761215000}}{8} +$$

$$\frac{1}{1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}}} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2} \right)_k \left(1 + \frac{4 e^{1.978234704486000} \pi^2}{75} - z_0 \right)^k z_0^{-k}}{k!}$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

And from

$$\frac{h^2}{32} = \frac{e^{-4\phi}}{\left[1 + \sqrt{1 + \frac{\Lambda}{3} e^{2\phi}} \right]^7} \left[42 \left(1 + \sqrt{1 + \frac{\Lambda}{3} e^{2\phi}} \right) - 13 \Lambda e^{2\phi} \right].$$

we obtain:

$$e^{(-4 \times 0.989117352243) / [1 + \sqrt{((1 + 1/3 \times (4\pi^2)/25 \times e^{(2 \times 0.989117352243))})}]^7 \times [42(1 + \sqrt{((1 + 1/3 \times (4\pi^2)/25 \times e^{(2 \times 0.989117352243))})}) - 13 \times (4\pi^2)/25 \times e^{(2 \times 0.989117352243)}]}$$

Input interpretation:

$$\frac{e^{-4 \times 0.989117352243}}{\left(1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}} \right)^7 \left(42 \left(1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}} \right) - 13 \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243} \right)}$$

Result:

-0.034547055658...

-0.034547055658...

Series representations:

$$\left(\left(42 \left(1 + \sqrt{1 + \frac{(4\pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} - \frac{1}{25} (4\pi^2) 13 e^{2 \times 0.9891173522430000} \right) e^{-4 \times 0.9891173522430000} \right) / \left(1 + \sqrt{1 + \frac{(4\pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 = \right. \\ \left. - \left(42 \left(-25 e^{1.978234704486000} + 52 e^{3.956469408972000} \pi^2 - \right. \right. \right. \\ \left. \left. 25 e^{1.978234704486000} \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \right. \right. \\ \left. \left. \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k (e^{1.978234704486000} \pi^2)^{-k} \binom{\frac{1}{2}}{k} \right) \right) / \left(25 e^{5.934704113458000} \right. \\ \left. \left. \left(1 + \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k (e^{1.978234704486000} \pi^2)^{-k} \binom{\frac{1}{2}}{k} \right)^7 \right) \right)$$

$$\begin{aligned}
& \left(\left(42 \left(1 + \sqrt{1 + \frac{(4\pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} - \frac{1}{25} (4\pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right. \right. \\
& \quad \left. \left. e^{-4 \times 0.9891173522430000} \right) / \left(1 + \sqrt{1 + \frac{(4\pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 = \right. \\
& \quad - \left(\left(42 \left(-25 e^{1.978234704486000} + 52 e^{3.956469408972000} \pi^2 - \right. \right. \right. \\
& \quad \left. \left. 25 e^{1.978234704486000} \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \right. \right. \\
& \quad \left. \left. \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k (e^{1.978234704486000} \pi^2)^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \right) / \left(25 e^{5.934704113458000} \right. \\
& \quad \left. \left. \left(1 + \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k (e^{1.978234704486000} \pi^2)^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right)^7 \right) \right) \\
& \left(\left(42 \left(1 + \sqrt{1 + \frac{(4\pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} - \frac{1}{25} (4\pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right. \\
& \quad \left. e^{-4 \times 0.9891173522430000} \right) / \left(1 + \sqrt{1 + \frac{(4\pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 = \\
& \quad - \left(\left(42 \left(-25 e^{1.978234704486000} + 52 e^{3.956469408972000} \pi^2 - 25 e^{1.978234704486000} \right. \right. \right. \\
& \quad \left. \left. \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 + \frac{4 e^{1.978234704486000} \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!} \right) \right) / \left(25 \right. \\
& \quad \left. e^{5.934704113458000} \right. \\
& \quad \left. \left. \left(1 + \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 + \frac{4 e^{1.978234704486000} \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!} \right)^7 \right) \right) \\
& \text{for (not } (z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \leq 0))
\end{aligned}$$

From which:

$$\begin{aligned}
& 47 * 1 / (((-1 / (((((e^{(-4 * 0.989117352243)} / \\
& [1 + \sqrt{((1 + 1/3 * (4\pi^2)/25 * e^{(2 * 0.989117352243)}))])^7 * \\
& [42(1 + \sqrt{((1 + 1/3 * (4\pi^2)/25 * e^{(2 * 0.989117352243)}))}) - \\
& 13 * (4\pi^2)/25 * e^{(2 * 0.989117352243)}])])))))))
\end{aligned}$$

Input interpretation:

$$47 \left(- \left(1 / 1 / \left(\frac{e^{-4 \times 0.989117352243}}{\left(1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}} \right)^7} \right. \right. \right. \\ \left. \left. \left(42 \left(1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}} \right) - \right. \right. \right. \\ \left. \left. \left. 13 \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243} \right) \right) \right) \right)$$

Result:

1.6237116159...

1.6237116159.... result that is an approximation to the value of the golden ratio
1.618033988749...

Series representations:

$$- \left(47 / 1 / \left(e^{-4 \times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right) - \right. \right. \right. \\ \left. \left. \left. \frac{1}{25} (4 \pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right) / \\ \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 = \\ \left(1974 \left(-25 e^{1.978234704486000} + 52 e^{3.956469408972000} \pi^2 - \right. \right. \\ \left. \left. 25 e^{1.978234704486000} \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \right. \right. \\ \left. \left. \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k \left(e^{1.978234704486000} \pi^2 \right)^{-k} \left(\frac{1}{2} \right) \right) \right) / \left(25 e^{5.934704113458000} \right. \\ \left. \left(1 + \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k \left(e^{1.978234704486000} \pi^2 \right)^{-k} \left(\frac{1}{2} \right) \right) \right)^7$$

$$\begin{aligned}
& - \left(47 / 1 / \left(e^{-4 \times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} - \right. \right. \right. \right. \\
& \quad \left. \left. \left. \frac{1}{25} (4 \pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right) / \\
& \quad \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 \Bigg) = \\
& \left(1974 \left(-25 e^{1.978234704486000} + 52 e^{3.956469408972000} \pi^2 - \right. \right. \\
& \quad 25 e^{1.978234704486000} \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \\
& \quad \left. \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k \left(e^{1.978234704486000} \pi^2\right)^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \Bigg) / \left(25 e^{5.934704113458000} \right. \\
& \quad \left. \left(1 + \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k \left(e^{1.978234704486000} \pi^2\right)^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right)^7 \right) \\
& - \left(47 / 1 / \left(e^{-4 \times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} - \right. \right. \right. \right. \\
& \quad \left. \left. \left. \frac{1}{25} (4 \pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right) / \\
& \quad \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 \Bigg) = \\
& \left(1974 \left(-25 e^{1.978234704486000} + 52 e^{3.956469408972000} \pi^2 - 25 e^{1.978234704486000} \right. \right. \\
& \quad \left. \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 + \frac{4 e^{1.978234704486000} \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!} \right) \Bigg) / \left(25 e^{5.934704113458000} \right. \\
& \quad \left. \left(1 + \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 + \frac{4 e^{1.978234704486000} \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!} \right)^7 \right) \\
& \text{for (not } (z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \leq 0))
\end{aligned}$$

And again:

$$32 \left(\frac{e^{-4 \times 0.989117352243}}{\left(1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}} \right)^7} \right. \\ \left. \left[42 \left(1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}} \right) - 13 \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243} \right] \right)$$

Input interpretation:

$$32 \left(\frac{e^{-4 \times 0.989117352243}}{\left(1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}} \right)^7} \right. \\ \left. \left(42 \left(1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}} \right) - 13 \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243} \right) \right)$$

Result:

-1.1055057810...

-1.1055057810....

We note that the result -1.1055057810.... is very near to the value of Cosmological Constant, less 10^{-52} , thence 1.1056, with minus sign

Series representations:

$$\begin{aligned}
& \left(32 e^{-4 \times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} - \right. \right. \right. \\
& \quad \left. \left. \left. \frac{1}{25} (4 \pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right) / \\
& \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 = \\
& - \left(1344 \left(-25 e^{1.978234704486000} + 52 e^{3.956469408972000} \pi^2 - \right. \right. \\
& \quad \left. \left. 25 e^{1.978234704486000} \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \right. \right. \\
& \quad \left. \left. \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k \left(e^{1.978234704486000} \pi^2 \right)^{-k} \binom{\frac{1}{2}}{k} \right) \right) / \left(25 e^{5.934704113458000} \right. \\
& \quad \left. \left(1 + \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k \left(e^{1.978234704486000} \pi^2 \right)^{-k} \binom{\frac{1}{2}}{k} \right)^7 \right)
\end{aligned}$$

$$\begin{aligned}
& \left(32 e^{-4 \times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} - \right. \right. \right. \\
& \quad \left. \left. \left. \frac{1}{25} (4 \pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right) / \\
& \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 = \\
& - \left(\left(1344 \left(-25 e^{1.978234704486000} + 52 e^{3.956469408972000} \pi^2 - \right. \right. \right. \\
& \quad \left. 25 e^{1.978234704486000} \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \right. \\
& \quad \left. \left. \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k (e^{1.978234704486000} \pi^2)^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \right) / \left(25 e^{5.934704113458000} \right. \\
& \quad \left. \left. \left(1 + \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k (e^{1.978234704486000} \pi^2)^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right)^7 \right) \right)
\end{aligned}$$

$$\begin{aligned}
& \left(32 e^{-4 \times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} - \right. \right. \right. \\
& \quad \left. \left. \left. \frac{1}{25} (4 \pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right) / \\
& \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 = \\
& - \left(\left(1344 \left(-25 e^{1.978234704486000} + 52 e^{3.956469408972000} \pi^2 - 25 e^{1.978234704486000} \right. \right. \right. \\
& \quad \left. \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 + \frac{4 e^{1.978234704486000} \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!} \right) \right) / \left(25 \right. \\
& \quad \left. e^{5.934704113458000} \right. \\
& \quad \left. \left(1 + \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 + \frac{4 e^{1.978234704486000} \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!} \right)^7 \right)
\end{aligned}$$

for (not $(z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \leq 0)$)

And:

$$- [32 \left(\frac{e^{-4 \times 0.989117352243}}{\left(1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}} \right)^7} \right. \\ \left. [42 \left(1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}} \right) - 13 \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}] \right)^5$$

Input interpretation:

$$- \left[32 \left(\frac{e^{-4 \times 0.989117352243}}{\left(1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}} \right)^7} \right. \right. \\ \left. \left(42 \left(1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}} \right) - \right. \right. \\ \left. \left. \left. 13 \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243} \right) \right) \right)^5$$

Result:

1.651220569...

1.651220569.... result very near to the 14th root of the following Ramanujan's class invariant $Q = (G_{505}/G_{101/5})^3 = 1164.2696$ i.e. 1.65578...

Series representations:

$$\begin{aligned}
& - \left(\left(32 e^{-4 \times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right) - \right. \right. \right. \\
& \quad \left. \left. \left. \frac{1}{25} (4 \pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right) / \\
& \quad \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 \Bigg)^5 = \\
& \left(4385270057140224 \left(-25 + 52 e^{1.978234704486000} \pi^2 - 25 \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \right. \right. \\
& \quad \left. \left. \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k \left(e^{1.978234704486000} \pi^2 \right)^{-k} \left(\frac{1}{2} \right)^5 \right) \right) / \\
& \quad \left(9765625 e^{19.78234704486000} \left(1 + \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \right. \right. \\
& \quad \left. \left. \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k \left(e^{1.978234704486000} \pi^2 \right)^{-k} \left(\frac{1}{2} \right)^{35} \right) \right)
\end{aligned}$$

$$\begin{aligned}
& - \left(\left(32 e^{-4 \times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right) - \right. \right. \right. \\
& \quad \left. \left. \left. \frac{1}{25} (4 \pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right) / \\
& \quad \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 \Bigg)^5 = \\
& \left(4385270057140224 \left(-25 + 52 e^{1.978234704486000} \pi^2 - 25 \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \right. \right. \\
& \quad \left. \left. \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k (e^{1.978234704486000} \pi^2)^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right)^5 \right) / \\
& \quad \left(9765625 e^{19.78234704486000} \left(1 + \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \right. \right. \\
& \quad \left. \left. \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k (e^{1.978234704486000} \pi^2)^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right)^{35} \right)
\end{aligned}$$

$$\begin{aligned}
& - \left(\left(32 e^{-4 \times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right) - \right. \right. \right. \\
& \quad \left. \left. \left. \frac{1}{25} (4 \pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right) / \\
& \quad \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 \Bigg)^5 = \\
& \left(4385270057140224 \left(-25 + 52 e^{1.978234704486000} \pi^2 - \right. \right. \\
& \quad \left. \left. 25 \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 + \frac{4 e^{1.978234704486000} \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!} \right)^5 \right) / \\
& \quad \left(9765625 e^{19.78234704486000} \right. \\
& \quad \left. \left(1 + \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 + \frac{4 e^{1.978234704486000} \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!} \right)^{35} \right)
\end{aligned}$$

for (not $(z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \leq 0)$)

We obtain also:

$$-\left[32\left(\frac{e^{-4 \times 0.989117352243}}{\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4 \pi^2\right) e^{2 \times 0.989117352243}}\right)^7}\right)}\right)^7 \times \left[42\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4 \pi^2\right) e^{2 \times 0.989117352243}}\right)}\right)-13\left(\frac{1}{25}\left(4 \pi^2\right) e^{2 \times 0.989117352243}\right)\right]\right)^{1 / 2}$$

Input interpretation:

$$-\sqrt{\left(32\left(\frac{e^{-4 \times 0.989117352243}}{\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4 \pi^2\right) e^{2 \times 0.989117352243}}\right)^7}\right)}\right)^7 \times \left[42\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4 \pi^2\right) e^{2 \times 0.989117352243}}\right)}\right)-13\left(\frac{1}{25}\left(4 \pi^2\right) e^{2 \times 0.989117352243}\right)\right]\right)^{1 / 2}}$$

Result:

$$-0.10514303501 \ldots i$$

Polar coordinates:

$$r=1.05143035007 \text { (radius), } \theta=-90^{\circ} \text { (angle)}$$

$$1.05143035007$$

Series representations:

$$\begin{aligned}
 & - \sqrt{\left(\left(32 e^{-4 \times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} - \right. \right. \right. \right. \\
 & \quad \left. \left. \left. \frac{1}{25} (4 \pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right) / \right. \\
 & \quad \left. \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 \right) = -\frac{8}{5} \sqrt{21} \\
 & \sqrt{\left(\left(25 - 52 e^{1.978234704486000} \pi^2 + 25 \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \right. \right. \\
 & \quad \left. \left. \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k (e^{1.978234704486000} \pi^2)^{-k} \left(\frac{1}{2} \right) \right) \right) / \left(e^{3.956469408972000} \right. \\
 & \quad \left. \left(1 + \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k (e^{1.978234704486000} \pi^2)^{-k} \left(\frac{1}{2} \right) \right)^7 \right) \right)
 \end{aligned}$$

$$\begin{aligned}
& - \sqrt{\left(\left(32 e^{-4 \times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} - \right. \right. \right. \right. \\
& \quad \left. \left. \left. \frac{1}{25} (4 \pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right) / \\
& \quad \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 \Bigg) = -\frac{8}{5} \sqrt{21} \\
& \sqrt{\left(\left(25 - 52 e^{1.978234704486000} \pi^2 + 25 \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \right. \right. \\
& \quad \left. \left. \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k (e^{1.978234704486000} \pi^2)^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) / \right. \\
& \quad \left. \left(e^{3.956469408972000} \left(1 + \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \right. \right. \right. \\
& \quad \left. \left. \left. \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k (e^{1.978234704486000} \pi^2)^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right)^7 \right) \right) \Bigg) \\
& - \sqrt{\left(\left(32 e^{-4 \times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} - \right. \right. \right. \right. \\
& \quad \left. \left. \left. \frac{1}{25} (4 \pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right) / \\
& \quad \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 \Bigg) = \\
& -\frac{8}{5} \sqrt{21} \sqrt{\left(\left(25 - 52 e^{1.978234704486000} \pi^2 + \right. \right. \\
& \quad \left. \left. 25 \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 + \frac{4 e^{1.978234704486000} \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!} \right) / \right. \\
& \quad \left(e^{3.956469408972000} \right. \\
& \quad \left. \left. \left(1 + \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 + \frac{4 e^{1.978234704486000} \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!} \right)^7 \right) \right) \Bigg)
\end{aligned}$$

for (not $(z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \leq 0)$)

$$\frac{1}{\left[\frac{32(e^{-4 \cdot 0.989117352243})}{1 + \sqrt{\left(\left(1 + \frac{1}{3} \cdot (4\pi^2)/25 \cdot e^{(2 \cdot 0.989117352243)} \right) \right)^7} \cdot \left(42 \left(1 + \sqrt{\left(\left(1 + \frac{1}{3} \cdot (4\pi^2)/25 \cdot e^{(2 \cdot 0.989117352243)} \right) \right) - \frac{13 \cdot (4\pi^2)}{25} \cdot e^{(2 \cdot 0.989117352243)} \right) \right)} \right]^{1/2}}$$

Input interpretation:

$$- \left(1 / \left(\sqrt{\left(32 \frac{e^{-4 \times 0.989117352243}}{\left(1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}} \right)^7} \right.} \right. \right.$$

Result:

 $0.95108534763... i$

Polar coordinates:

$$r = 0.95108534763 \text{ (radius)}, \quad \theta = 90^\circ \text{ (angle)}$$

0.95108534763

We know that the primordial fluctuations are consistent with Gaussian purely adiabatic scalar perturbations characterized by a power spectrum with a spectral index $n_s = 0.965 \pm 0.004$, consistent with the predictions of slow-roll, single-field, inflation.

Thence 0.95108534763 is a result very near to the spectral index n_s , to the mesonic Regge slope, to the inflaton value at the end of the inflation 0.9402 and to the value of the following Rogers-Ramanujan continued fraction:

$$\frac{e^{\frac{\pi}{5}}}{\sqrt{(\varphi-1)\sqrt{5}-\varphi+1}} = 1 - \frac{e^{-\pi}}{1 + \frac{e^{-2\pi}}{1 + \frac{e^{-3\pi}}{1 + \frac{e^{-4\pi}}{1 + \dots}}}} \approx 0.9568666373$$

Series representations:

$$-\left(1/\sqrt{\left(\left(32 e^{-4 \times 0.9891173522430000}\left(42\left(1+\sqrt{1+\frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}}\right.\right.\right.\right.\right.$$

$$\left(1 + \sqrt{1 + \frac{(4\pi^2)e^{2 \times 0.9891173522430000}}{3 \times 25}}\right)^7 \Bigg) =$$

$$- \left(5 / \left(8 \sqrt{21} \sqrt{\left(25 - 52 e^{1.978234704486000} \pi^2 + 25 \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}}\right.}\right.\right.$$

$$\left.\left.\sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k \left(e^{1.978234704486000} \pi^2\right)^{-k} \left(-\frac{1}{2}\right)_k}{k!}\right) / \right.$$

$$\left.\left(e^{3.956469408972000} \left(1 + \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}}\right.\right.\right.$$

$$\left.\left.\sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k \left(e^{1.978234704486000} \pi^2\right)^{-k} \left(-\frac{1}{2}\right)_k}{k!}\right)^7 \right) \Bigg) \Bigg)$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

$$= -0.034547055658\dots$$

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$$1+1/(((4((2*e^{(-0.989117352243/2)})) / (((1+\sqrt{((1+1/3*(4\pi^2)/25*e^{(2*0.989117352243))}))))))))) + (-0.034547055658)$$

Input interpretation:

$$1 + \frac{1}{4 \times \frac{2 e^{-0.989117352243/2}}{1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}}}} - 0.034547055658$$

Result:

1.61976215705...

1.61976215705..... result that is a very good approximation to the value of the golden ratio 1.618033988749...

Series representations:

$$1 + \frac{1}{4 \left(2 e^{-0.9891173522430000/2} \right)} - 0.0345470556580000 =$$

$$\frac{1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}}}{0.9654529443420000 + \frac{e^{0.4945586761215000}}{8} + \frac{1}{8} e^{0.4945586761215000}}$$

$$\sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75} \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k \left(e^{1.978234704486000} \pi^2 \right)^{-k} \left(\frac{1}{2} \right)_k}$$

$$1 + \frac{1}{4 \left(2 e^{-0.9891173522430000/2} \right)} - 0.0345470556580000 =$$

$$\frac{1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}}}{0.9654529443420000 + \frac{e^{0.4945586761215000}}{8} + \frac{1}{8} e^{0.4945586761215000}}$$

$$\sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75} \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4} \right)^k \left(e^{1.978234704486000} \pi^2 \right)^{-k} \left(-\frac{1}{2} \right)_k}{k!}}$$

$$\begin{aligned}
& 1 + \frac{1}{4 \left(2 e^{-0.9891173522430000/2} \right)} - 0.0345470556580000 = \\
& \frac{1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}}}{0.9654529443420000 + \frac{e^{0.4945586761215000}}{8} +} \\
& \frac{\frac{1}{8} e^{0.4945586761215000} \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 + \frac{4 e^{1.978234704486000} \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!}}{for (not (z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \leq 0))}
\end{aligned}$$

Observations

We note that, from the number 8, we obtain as follows:

$$8^2$$

$$64$$

$$8^2 \times 2 \times 8$$

$$1024$$

$$8^4 = 8^2 \times 2^6$$

True

$$8^4 = 4096$$

$$8^2 \times 2^6 = 4096$$

$$2^{13} = 2 \times 8^4$$

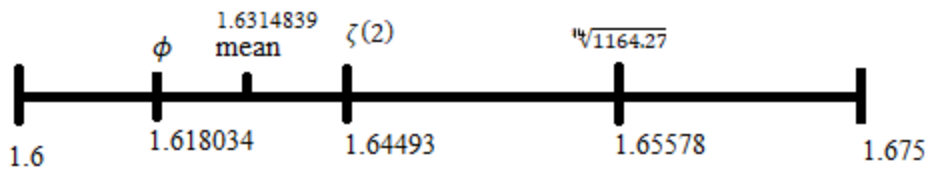
True

$$2^{13} = 8192$$

$$2 \times 8^4 = 8192$$

We notice how from the numbers 8 and 2 we get 64, 1024, 4096 and 8192, and that 8 is the fundamental number. In fact $8^2 = 64$, $8^3 = 512$, $8^4 = 4096$. We define it "fundamental number", since 8 is a Fibonacci number, which by rule, divided by the previous one, which is 5, gives 1.6, a value that tends to the golden ratio, as for all numbers in the Fibonacci sequence

“Golden” Range



Finally we note how $8^2 = 64$, multiplied by 27, to which we add 1, is equal to 1729, the so-called "Hardy-Ramanujan number". Then taking the 15th root of 1729, we obtain a value close to $\zeta(2)$ that 1.6438 ..., which, in turn, is included in the range of what we call "golden numbers"

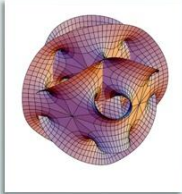
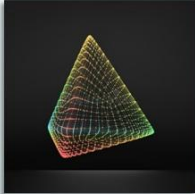
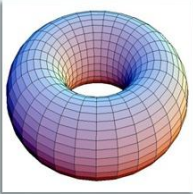
Furthermore for all the results very near to 1728 or 1729, adding $64 = 8^2$, one obtain values about equal to 1792 or 1793. These are values almost equal to the Planck multipole spectrum frequency 1792.35 and to the hypothetical Gluino mass

Appendix

Outlook

Remarkably rich (apparently **UNIQUE**) framework

BUT :



Why a given **“shape” of the extra dimensions** ?
[**CRUCIAL**, it determines the predictions for α , ...]

⏪ / ⏩A. Sagnotti – AstronomiAmo, 23.4.202021

From: A. Sagnotti – AstronomiAmo, 23.04.2020

In the above figure, it is said that: “why a given shape of the extra dimensions? Crucial, it determines the predictions for α ”.

We propose that whatever shape the compactified dimensions are, their geometry must be based on the values of the golden ratio and $\zeta(2)$, (the latter connected to 1728 or 1729, whose fifteenth root provides an excellent approximation to the above mentioned value) which are recurrent as solutions of the equations that we are going to develop. It is important to specify that the initial conditions are **always** values belonging to a fundamental chapter of the work of S. Ramanujan "Modular equations and Approximations to Pi" (see references). These values are some multiples of 8 (64 and 4096), 276, which added to 4096, is equal to 4372, and finally $e^{\pi\sqrt{22}}$

We have, in certain cases, the following connections:

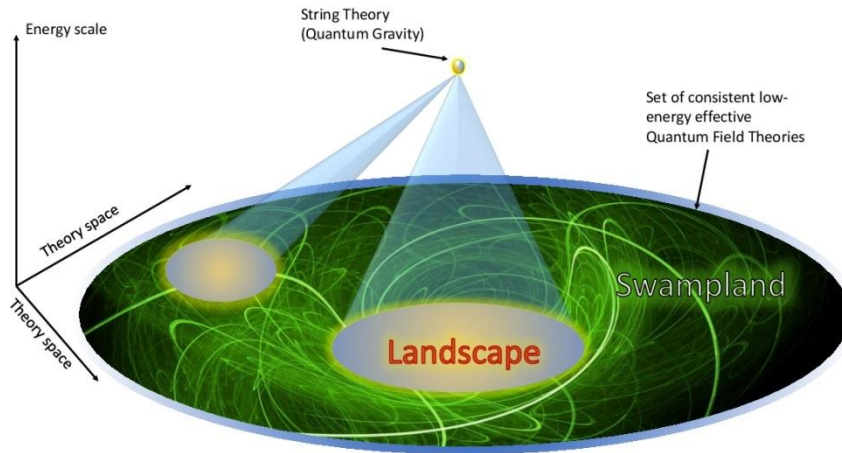
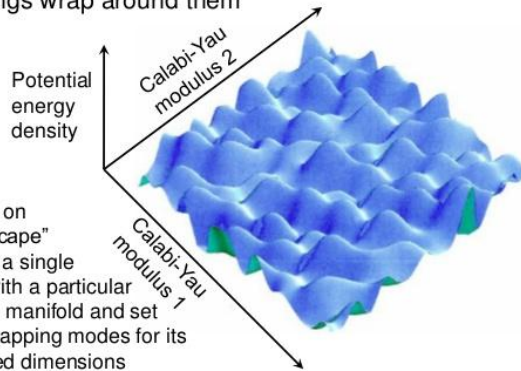


Fig. 1

The String Theory “Landscape”

- Graph axes show only 2 out of hundreds of parameters (“moduli”) that determine the exact Calabi-Yau manifolds and how strings wrap around them



- Each point on the “Landscape” represents a single Universe with a particular Calabi-Yau manifold and set of string wrapping modes for its compactified dimensions
- Each Universe could be realized in a separate post-inflation “bubble”

Fig. 2

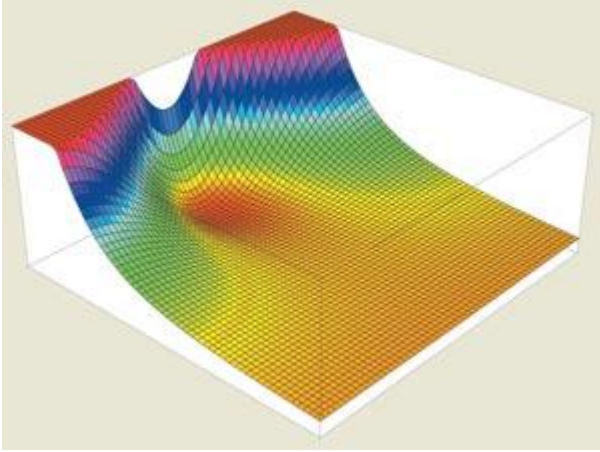


Fig. 3

Stringscape - a small part of the string-theory landscape showing the new de Sitter solution as a local minimum of the energy (vertical axis). The global minimum occurs at the infinite size of the extra dimensions on the extreme right of the figure.

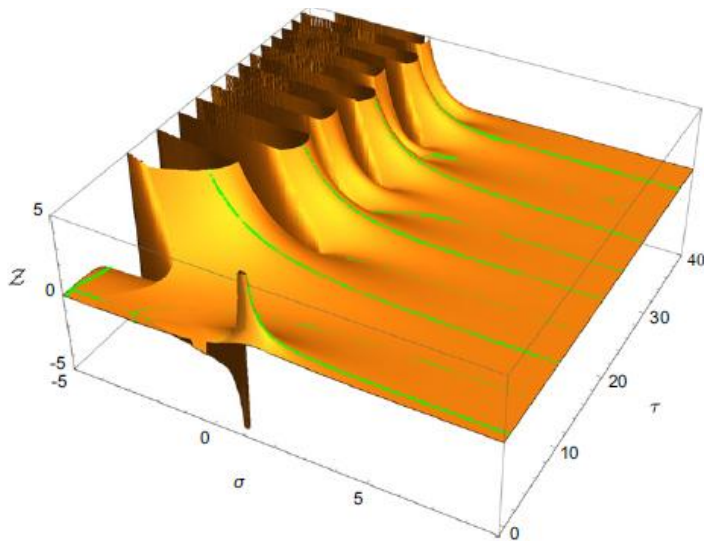


Figure 2. Lines in the complex plane where the Riemann zeta function ζ is real (green) depicted on a relief representing the positive absolute value of ζ for arguments $s \equiv \sigma + i\tau$ where the real part of ζ is positive, and the negative absolute value of ζ where the real part of ζ is negative. This representation brings out most clearly that the lines of constant phase corresponding to phases of integer multiples of 2π run down the hills on the left-hand side, turn around on the right and terminate in the non-trivial zeros. This pattern repeats itself infinitely many times. The points of arrival and departure on the right-hand side of the picture are equally spaced and given by equation (11).

Fig. 4

With regard the Fig. 4 the points of arrival and departure on the right-hand side of the picture are equally spaced and given by the following equation:

$$\tau'_k \equiv k \frac{\pi}{\ln 2},$$

with $k = \dots, -2, -1, 0, 1, 2, \dots$

we obtain:

$$2\pi/(\ln(2))$$

Input:

$$2 \times \frac{\pi}{\log(2)}$$

Exact result:

$$\frac{2\pi}{\log(2)}$$

Decimal approximation:

9.0647202836543876192553658914333336203437229354475911683720330958
...

9.06472028365....

Alternative representations:

$$\frac{2\pi}{\log(2)} = \frac{2\pi}{\log_e(2)}$$

$$\frac{2\pi}{\log(2)} = \frac{2\pi}{\log(a) \log_a(2)}$$

$$\frac{2\pi}{\log(2)} = \frac{2\pi}{2 \coth^{-1}(3)}$$

Series representations:

$$\frac{2\pi}{\log(2)} = \frac{2\pi}{2i\pi \left\lfloor \frac{\arg(2-x)}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (2-x)^k x^{-k}}{k}} \quad \text{for } x < 0$$

$$\frac{2\pi}{\log(2)} = \frac{2\pi}{\log(z_0) + \left\lfloor \frac{\arg(2-z_0)}{2\pi} \right\rfloor \left(\log\left(\frac{1}{z_0}\right) + \log(z_0) \right) - \sum_{k=1}^{\infty} \frac{(-1)^k (2-z_0)^k z_0^{-k}}{k}}$$

$$\frac{2\pi}{\log(2)} = \frac{2\pi}{2i\pi \left\lfloor \frac{\pi - \arg\left(\frac{1}{z_0}\right) - \arg(z_0)}{2\pi} \right\rfloor + \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (2-z_0)^k z_0^{-k}}{k}}$$

Integral representations:

$$\frac{2\pi}{\log(2)} = \frac{2\pi}{\int_1^2 \frac{1}{t} dt}$$

$$\frac{2\pi}{\log(2)} = \frac{4i\pi^2}{\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{\Gamma(-s)^2 \Gamma(1+s)}{\Gamma(1-s)} ds} \quad \text{for } -1 < \gamma < 0$$

From which:

$$(2\pi/(\ln(2))) \cdot (1/12 \pi \log(2))$$

Input:

$$\left(2 \times \frac{\pi}{\log(2)}\right) \left(\frac{1}{12} \pi \log(2)\right)$$

$\log(x)$ is the natural logarithm

Exact result:

$$\frac{\pi^2}{6}$$

Decimal approximation:

1.6449340668482264364724151666460251892189499012067984377355582293
...

$$1.6449340668\dots = \zeta(2) = \frac{\pi^2}{6} = 1.644934 \dots$$

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